

Gen. Index for this volume found
by error in 1920. 4

SPECIAL INDEX.

New Genera, Species, Sub-Species, and Varieties are marked with an asterisk.

Order PROTURA, 174.

Order VII. ORTHOPTERA.

americana (Periplaneta), 95
auricularia (Forficula), 94
auricularia, var. forcipata (Forficula),
94
australasiae (Periplaneta), 95, 104
bicolor (Stauroderus), 96
bipunctatus (Gryllus), 247
bipunctatus (Tetrix), 89, 96
brachyptera (Metrioptera), 96
domesticus (Gryllus), 96, 127, 128, 246,
247
dorsalis (Conocephalus), 96
elegans (Chorthippus), 97
Euprepocnemini, 149
gallicus (Bacillus), 200
gongyloides (Gongylus), 200
grossus (Mecostethus), 89, 96
gryllotalpa (Gryllotalpa), 95
hystrix (Markia), 149

lapponicus (Ectobius), 95
lineatus (Stenobothrus), 96
Locustodea, 89
maculatus (Gomphocerus), 96
morus (Corausius), 200
orientalis (Blatta), 95
panzeri (Ectobius), 95
panzeri, var. nigripes (Ectobius), 95
parallelus (Chorthippus), 97
punctatissima (Leptophyes), 96, 272
religiosa (Mantis), 199
riparia (Labidura), 94
rufipes (Omocestus), 96
rufus (Gomphocerus), 96
sylvestris (Nemobius), 89, 95
thalassinum (Meconema), 96
viridissima (Locusta = Phasgonura), 89
viridulus (Omocestus), 96

Order XII. EPHEMEROPTERA.

Anagenesia, 178, 179
armatus (Siphurus), 246
danica (Ephemera), 246
dipterum (Clocon, recte Cloëon), 246
fusca (Habrophlebia), 246
helvipes (Leptophlebia), 246
longicauda (Palingenia), 177, 180
luteolum (Centrophilium, recte Centro-
ptilum), 246

*mesopotamica (Palingenia), 177, 178
Palingenia, 177, 178, 179
papuana (Palingenia), 179
Plethogenesia, 178, 179
rhenana (Oligoneuria), 180
robusta (?) (Palingenia), 177
virgo (Polymitarcys), 180
vulgata (Ephemera), 246

Order XIII. PARANEUROPTERA. [= ODONATA.]

ænea (Cordulia), 88
albistylum (Orthetrum), 262
cæruleata (Mecistogaster), 200
cancellatum (Orthetrum), 262
coriaceum (Pseudagrion), 263
cyanea (Æschna), 89, 121
cyanomelas (Xiphagrion), 263
elegans (Ischnura), 55
femina (Agriocnemis), 263
festiva (Trithemis), 263
fonsecolombii (Sympetrum), 197
grandis (Æschna), 150
imperator (Anax), 88, 89
lorquini (Nannophlebia), 263
microcephalum (Pseudagrion), 263

moluccensis (Caconeura), 263
nigra (Selysiothemis), 262
Orthetrum, 262
pratense (Brachytron), 88
pygmæa (Nannophya), 263
splendens (Calopteryx), 55
stigmatizans manadensis (Neurothemis),
263
striolatum (Sympetrum), 121
superba (Teinobasis), 263
terminata (Rhincocypha), 263
virgo (Calopteryx), 89, 262
virgo, race festiva (Calopteryx), 262
vulgatissimus (Gomphus), 88

Order XIV. THYSANOPTERA.

Thrips, 198

| Trichothrips, 164

Order XV. RHYNCHOTA.

- abdominalis (Cyclopelta), 166
 *aberrans (Paterculus), 169
 aceris (Phenacorus), 199
 affinis (Paterculus), 169
 africanus (Aspidoproctus), 176
 alata (Dalcantara), 164
 ampicollis (Carpone), 164
 anchora (Antestia), 4
 angulata (Carpone), 164
 Apodiphus, 4
 *armata (Neoniphe), 3, 40
 basalis (Tolumnia), 3
 bicolor (Pterocomma), 233
 brevicorne (Megymerum), 166
 brunneus (Aspongopus), 166
 *centauriella (Anuraphis), 230
 cerasi (Myzus), 247
 *chapana (Epagathus), 4, 69
 chinensis (Aspongopus), 166
 coccinea (Gonopsis), 168
 *coloratus (Diplorhinus), 168
 contingens (Pentatoma), 41
 convexa (Hoplistodera), 41
 coronatus (Aleimocoris), 3
 crassiventris (Carbula), 3
 crucigera (Strachia), 4
 currens (Velia), 246
 cyperi (Thripsaphis), 231
 Dabessus, 69
 denticulifera (Tetroda), 168
 dilatata (Salvianus), 168
 diomedes (Eusthenes), 165
 dubius (Agothocles), 4, 42
 *elongata (Liengia), 164, 166
 *Epagathus, 68
 femoralis (Agonoscelis), 4
 ferruginescens (Tolumnia), 41
 fimbriata (Plantia), 4
 flavescens (Ptyelus), 200
 fletcheri (Halyomorpha), 3
 florens (Anaca), 4
 *fraxini (Pterocomma), 233
 fullo (Erthesina), 3
 fuscus (Aspongopus), 166
 glandulosa (Chalcopis), 168
 guttiger (Eusarcocoris), 3
 heros (Eurostus), 164
 hirundinis (Cimex), 149
 histeroides (Tetroda), 168
 Hoplistodera, 42
 *humeralis (Eusthenes), 164, 165
 humeralis (Rhynchocoris), 4
 imperialis (Hedobia), 200
 incarnatus (Catacanthus), 4
 incisa (Hoplistodera), 41
 insignis (Vitruvius), 164
 jaceæ (Macrosiphum), 230
 *jacksoni (Pterocomma), 232
 jaspideus (Mattiphus), 164, 166
 javanica (Tessaratomia), 164
 jurtina, 68
 *laosana (Dalpada), 3, 4
 *laosana (Menida), 4, 43
 *laosana (Aspongopus), 166
 lata (Prionaca), 4
 latipes (Pentatoma), 41
 latipes (Tolumnia), 3, 41
 *latula (Tetroda), 168
 lectularius (Cimex), 168, 300
 limatus (Megarhynchus), 168
 lineatifrons (Crictheus), 4
 mansonicus (Exithemus), 4
 marginatus (Aspongopus), 167
 *mekongum (Megymenum), 166
 Mesolea, 164
 mimus (Agæus), 3
 modificata (Anaca), 4
 *Neojurtina, 68
 *Neoniphe, 40
 Neosalica, 164
 nigrescens (Prionica), 43
 nigridorsis (Asiarcha), 164
 *nigritus (Laprius), 3, 6
 nigriventris (Aspongopus), 166
 *nigroscutellata (Tessaratomia), 164, 165
 *nigrovittata (Neosalica), 164
 Niphe, 40
 nubila (Agonoscelis), 4
 obscura (Cyclopelta), 166
 obscura (Amyntor), 3
 obtusa (Tetroda), 169
 ochraceum (Pycanum), 164
 oculata (Dalpada), 3
 Origanus, 166
 *Ouscha, 4
 parallelum (Megymenum), 166
 parva (Cyclopelta), 167
 perelegens (Dalpada), 3
 picus (Halyomorpha), 3
 pomorum (Mylelaspis), 247
 ponderosum (Pycanum), 164
 populeus (Pterocomma), 233
 pulchra (Anaca), 4
 pulchrum (Eurydema), 4
 quadrata (Tessaratomia), 164
 quercus (Stomaphis), 300
 *raja (Menida), 4, 43
 robustus (Eusthenes), 164
 rosaceus (Eusarcocoris), 3
 rostratus (Megarhynchus), 168
 rubefactus (Eusthenes), 164, 165
 *rugosa (Cyclopelta), 166
 *rugosus (Halys), 3, 5
 *rugulosa (Sacontala), 3, 42

sævus (Eusthenes), 164
**salvazana* (Gonopsis), 168
**salvazana* (Menida), 4, 68
scabrata (Metonymia), 168
scutellaris (Eusthenes), 164
scutellata (Carbula), 3
**scutello-maculata* (Hoplistodera), 3, 41
smaragdina (Dalpada), 3
speciosum (Stenozygum), 4, 42
speciosum (Strachia), 42
**spinidens* (Udonga), 69
spinosum (Megymenum), 166
**spiridens* (Udonga), 4
**splendidus* (Mattiphus), 164, 166
subferruginea (Niphe), 3
taurus (Placosternum), 4
tessellatus (Agæus), 3

**tonkinensis* (Agæus), 3, 5
tonkinensis (Gonopsis), 168
**tonkinensis* (Hoplistodera), 3, 41
**tonkinensis* (Prionaca), 4, 43
truncatus (Megarhynchus), 168
**typica* (Neojurtina), 4, 68
**Udonga*, 69
unicolor (Halyabbas), 3
valida (Cressona), 168
varia (Dalpada), 3
vermicellaris (Plataspis), 174
**viridissima* (Ouscha), 3, 5
viridula (Nezara), 4
**vitalisana* (Menida), 4, 43
**vitalisanus* (Salvianus), 168
vittativentris (Niphe), 3
**Xiengia*, 164, 166

Order XVI. NEUROPTERA

alba (Chrysopa), 213
Ascalaphus, 200
capitata (Nothochrysa), 89
Chrysopa, 22
chrysops (Osmylus), 89, 212
communis (Panorpa), 78, 213
communis, var. *aperta* (Panorpa), 78
**communis*, var. *exstincta* (Panorpa), 78
concinus (Hemerobius), 213
elegans (Hemerobius), 212
flava (Chrysopa), 213
fuliginosa (Sialis), 212
germanica (Panorpa), 213
Hemerobius, 22, 212
humuli (Hemerobius), 212, 213
hyemalis (Boreus), 272
libelluloides (Palpares), 212
lutaria (Sialis), 212

lutescens (Hemerobius), 213
maculicollis (Raphidia), 212
micans (Hemerobius), 212, 213
Nemopteron (*recte* Nemoptera), 80
ottomanus (Ascalaphus), 247
paganus (Micromus), 213
Palpares, 200
perla (Chrysopa), 213
prasina (Chrysopa), 213
quadrifasciatus (Hemerobius), 212
Raphidia, 89, 212
septempunctata (Chrysopa), 213
stigma (Hemerobius), 103, 127, 212, 213
subnebulosus (Hemerobius), 212, 213
tenella (Chrysopa), 213
vittata (Chrysopa), 213
vulgaris (Chrysopa), 213
vulgaris, form *carnea* (Chrysopa), 213

Order XVII. TRICHOPTERA.

affinis (Limnophilus), 246
centralis (Limnophilus), 245
ciliaris (Notidobia), 245
consersa (Plectrocnemia), 245
lunatus (Limnophilus), 246
marmoratus (Limnophilus), 246

pellucidula (Hydropsyche), 245
pilosa (Goëra), 245
sparsus (Limnophilus), 245
trimaculatus (Cyrnus), 245
xanthodes (Limnophilus), 246

Order XVIII. LEPIDOPTERA.

abbottii (Heodes), 299
abbreviata (Eupithecia), 80, 261
abjecta (Haina), 141
abjectana (Oxigrapta), 160
abruptaria (Hemerophila), 200
absinthia (Cucullia), 161
absinthiata (Eupithecia), 260
aceris (Acronycta), 91
achatis (Mamestra), 33
acis (Nomiades), 304
actæon (Adopæa), 123
actæon (Thymelicus), 21

acuminatella (Gelechia), 90
adæquata (Emmelesia), 56
adæquata (Perizoma), 259
adippe (Argynnis), 86
adjustella (Blastobasis), 199
adoratrix (Colias), 156, 251, 253
adpersella (Depressaria), 76
adusta (Eumichtis), 34
adustata (Ligdia), 261
advena (Aplecta), 56
advenaria (Epione), 20, 144
ægídon (Plebeius), 282

- ægon (Plebeius), 21, 51, 56, 119, 272,
 290, 292, 296, 297
 ægra (Colias), 186, 253
 æquivalens (Nephele), 107
 ærata (Miana), 34
 ærugana (Oxigrapha), 158, 189, 210
 æscularia (Anisopteryx), 283
 æsculi (Nordmannia), 300
 æthiops (Xylophasia), 35
 affinis (Calymnia), 56
 affinis (Cosmia), 143
 affinitata (Perizoma), 259, 288
 agathina (Agrotis), 32, 92
 aglaia (Argynnis), 21, 50, 51, 79, 80,
 100, 120, 122, 124, 295
 agrammella (Coleopora), 219
 agrippina (Thysania), 174
 alba (Chrysophanus), 268
 alba (Rumicia), 79, 300
 albiana (Zygæna), 150
 albicans (Agriades), 22
 albicillata (Mesoleuca), 259
 albida (Epinephele), 51
 albida (Platyptilia), 276
 albimacula (Dianthœcia), 93, 126
 *albipicta (Hypena), 205
 albipuncta (Leucania), 142
 albipunctana (Peronea), 35
 albipunctata (Eupithecia), 89, 260, 289,
 293
 albipunctella (Tinea), 117
 *albisecta (Characomia), 237
 albissima (Colias), 156, 253
 *albig stigma (Pangraptica), 273
 alboflammana (Peronea), 14, 38, 64
 albonigrana (Peronea), 38
 alboruficostana (Peronea), 13, 38, 65
 albovenosa (Arsilonche), 55, 56, 91
 albovittana (Peronea), 39
 albulalis (Nola), 10
 albulata (Perizoma), 259
 alchemillata (Perizoma), 259
 alciphron (Hysa), 149
 alcyonipennella (Coleophora), 117
 alexanor (Papilio), 17
 alismiana (Phalonia), 219
 alni (Aceronycta), 56, 91, 103, 173
 alniaria (Ennomos), 282
 alternata (Xanthorhoë), 246
 ambigua (Caradrina), 242
 ambigualis (Scoparia), 52
 americana (Arctia), 238
 amphidamas (Chrysophanus), 282
 ampla (Colias), 187, 253
 anceps (Zygæna), 150
 angelicata (Eupithecia), 289
 angustior (Colias), 280
 annulata (Cosymbia), 286
 anomala (Stilbia), 114
 antiopa (Euvanessa), 24, 124, 243, 267,
 291, 300
 antiqua (Orgyia), 149
 apennina (Agriades), 22
 aphiraphe (Brenthis), 281
 apiciaria (Epione), 283
 apollo (Parnassius), 80
 aprilina (Agriopis), 35
 aquilina (Agrotis), 91
 aquilo (Latiiorina), 282
 arceuthina (Argyresthia), 89
 archippus (Danais), 211
 arcuosa (Petilampæ), 114
 areola (Xylocampa), 115
 arete (Aphantopus), 80
 argentana (Ablabia), 90
 *argentimarginata (Nygma), 273
 argentula (Bankia), 55
 argiades (Everes), 269
 argiolus (Celastrina), 51, 78, 120, 122,
 147, 174, 197, 200, 240, 242, 296, 297
 argiolus (Cyaniris), 290, 292
 argus (Plebeius), 51, 282, 290
 argyrognomon (Plebeius), 282
 arion (Lycæna), 103, 118
 aristeus (Papilio), 180
 armigera (Heliothis), 162, 224
 arsilache (Brenthis), 281
 artaxerxes (Aricia), 249
 artemis (Melitæa), 124
 arundinis (Nonagria), 55
 ashworthii (Agrotis), 92
 asinalis (Botys), 20
 aspersana (Oxigrapha), 187
 aspersella (Depressaria), 75
 assimilata (Eupithecia), 80, 260
 assimilis (Crymodes), 90
 asteris (Cucullia), 161
 astrarche (Aricia), 249
 atalanta (Pyrameis), 18, 20, 21, 50, 51,
 78, 86, 100, 101, 119, 120, 122, 123,
 147, 148, 198, 238, 247, 268, 269,
 281, 291, 295
 athalia (Melitæa), 97, 300, 301
 atomaria (Ematurga), 200, 288, 300
 atrana (Peronea), 39
 atrata (Odezia), 207
 atricapitana (Eupœcilia), 117
 atriplicis (Trachea), 140
 atrofasciata (Colias), 185, 253
 atropos (Acherontia), 146, 223
 atropos (Manduca), 219, 291
 attaliana (Peronea), 38, 65
 aubuissoni (Colias), 185, 253
 augur (Noctua), 32
 aurago (Ochria), 143
 aurago (Tiliacea), 200
 aurana (Epinotia), 117
 aurana (Trycheris), 117
 aurantiaria (Hybernia), 283
 aurantina (Lithosia), 12
 aureola (Cryptcephalus), 200
 auricoma (Acronycta), 91
 auriflua (Porthesia), 270
 aurinia (Melitæa), 50, 79, 267
 aurorina (Colias), 186, 280
 aurota (Rothschildia), 247
 austerata (Eupithecia), 260
 *autocnista (Depressaria), 76

- autumnalis (Colias), 137, 253
 autumnaria (Oporabia), 79
 autumnata (Oporabia), 173, 258
 avalon (Lycæna), 103
 aversata (Acidalia), 207
 badia (Anticlea), 260
 baia (Noctua), 32
 barrettii (Dianthœcia), 93
 *basalis (Pseudaglossa), 205
 basilinea (Apamea), 34
 bedellecta (Elachista), 90
 belgiaria (Scodiona), 284
 bellargus (Agriades), 21, 51, 56, 121, 197, 241, 244, 297, 298
 bentleyana (Peronea), 39
 berenice (Anosia), 246
 betulæ (Zephyrus), 51, 85, 122
 betularia (Amphidasys), 219, 300
 betularia (Pachys), 283
 bianor (Papilio), 244
 bicolorata (Mesoleuca), 259
 bicolorata (Ptemyria), 287
 bicoloria (Miana), 34
 bidentata (Gonodontis), 79, 148, 282
 bifasciata (Perizoma), 259
 bifida (Cerura), 144
 bifractella (Aristotelia), 117
 *biguttulata (Nygma), 274
 bilineata (Camptogramma), 259
 bilineata (Clanis), 105
 bilunaria (Selenia), 79, 282
 *bimacula (Trigonodesma), 203
 bimaculata (Colias), 186, 253
 biobsoleta (Cosymbia), 286
 bipuncta (Senta), 141
 bisetata (Acidalia), 207
 biundularia (Tephrosia), 56
 blomeri (Asthenia), 247
 bæticus (Lampides), 80, 103, 244
 boisduvali (Theretra), 109
 bombyliiformis (Sesia), 117
 bore (Eneis), 281
 borealis (Brenthis), 281
 borealis (Phragmatobia), 10
 brachydactylus (Pselinophorus), 90, 118
 brachymorpha (Platyptilia), 275
 bractea (Plusia), 116, 162
 bradyporina (Acronycta), 90
 brassicæ (Barathra), 33
 brassicæ (Pieris), 19, 20, 21, 51, 79, 85, 100, 119, 122, 147, 151, 154, 173, 197, 201
 *brevicauda (Sypna), 202
 brevilinea (Leucania), 142
 briseis (Hipparchia), 124
 brumata (Cheimatobia), 208
 brunnea (Calocampa), 115
 brunnea (Colias), 157, 253
 brunnea (Hydrœcia), 113
 brunnea (Noctua), 32
 brunnea (Tœniocampa), 115
 brunneana (Peronea), 38
 brunneata (Halia), 56
 brunneata (Thamnonoma), 103
 brunnescens (Catocala), 162
 bryoniæ (Pieris), 281, 300
 buoliana (Retinia), 8
 butleri (Dione), 276
 byringerana (Tortrix), 16
 c-album (Polygonia), 78, 101, 117, 195, 243, 244
 c-nigrum (Agrotis), 32
 cæca (Hyperanthus), 200
 cærulea (Colias), 156, 253
 cærulea (Polyommatus), 100, 240
 cæruleopunctata (Chrysophanus), 17, 78, 101, 121, 126, 241, 268, 296
 cæruleopunctata (Rumicia), 300
 cærulescens (Tœniocampa), 114
 cæsia (Dianthœcia), 93
 cæsiata (Entephria), 258
 caia (Arctia), 11, 104, 238, 247, 292
 californica (Cœnonympha), 102
 caliginosa (Acosmetia), 142
 callianthe (Actinote), 279
 *callianthina (Eresia), 279
 callunæ (Lasiocampa), 104
 callunaria (Eupithecia), 289
 cambria (Venusia), 258
 campanulata (Eupithecia), 289
 candiope (Polyommatus), 298
 canidia (Pieris), 22
 caniola (Lithosia), 12
 cannæ (Nonagria), 141
 capreolella (Depressaria), 117
 capsicola (Dianthœcia), 33
 capsophila (Dianthœcia), 93
 capucina (Miselia), 35
 capucina (Peronea), 33, 66
 cardamines (Euchlœ), 44, 50, 51, 80, 85, 100, 119, 121, 122, 147, 148, 150, 173, 175, 197, 199, 272, 295
 *cardinalis (Nagoda), 274
 cardui (Pyrameis), 20, 21, 50, 51, 55, 79, 86, 100, 101, 117, 120, 122, 222, 241, 268, 270, 291, 295
 carmelita (Odontesia), 221
 carniolica (Zygæna), 174
 carpinata (Lobophora), 207
 carpophaga (Dianthœcia), 93
 cashmirensis (Zygæna), 22
 castanea (Noctua), 56, 92
 castigata (Eupithecia), 260
 catena (Augiades), 282
 caulosticta (Euchlœ), 175
 ceacus (Callophrys), 297
 cecilia (Erebia), 80
 celata (Theretra), 108
 centaureæ (Hesperia), 282
 centonalis (Nola), 10
 *ceramensis (Oxyambulyx), 105
 cernus (Agriades), 247
 cerri (Nordmannia), 300
 *ceylonica (Tajuria), 206
 chærophylella (Epermenia), 90, 118
 chalcedon (Melitæa), 103
 chamomillæ (Cucullia), 161
 chantana (Peronea), 38, 65

- chariclea* (Brenthis), 281
charlottana (Peronea), 15, 67
checla (Nygmia), 274
chi (Polia), 22, 223
christyi (Oporabia), 162
chrysanthemi (Zygæna), 80, 300
chrysippus (Danais), 272
chrysitis (Plusia), 116
chryson (Plusia), 162
chrysorrhea (Euproctis), 144
chrysotheme (Colias), 137, 155, 157, 187
chrysothemeformis (Colias), 157, 253
chrysozona (Dianthœcia), 93
cinerascens (Colias), 156, 252, 253
**cinerea* (Agrotis), 32, 91
cinxia (Melitæa), 51, 80, 122, 217, 244, 301
circe (Satyrus), 124
circellaris (Amathes), 115
circellata (Acidalia), 220
clara (Polyommatus), 152
clathrata (Chiasmia), 284
cleodora (Eronia), 175
cleodoxa (Argynnis), 80
clotho (Theretra), 108
clysonymus (Heliconius), 279
clytus (Leptoneura), 103
cœnia (Lœlia), 8
cognata (Thera), 89
columbina (Nola), 9
combusta (Xylophasia), 34
combustana (Peronea), 16, 36, 102
comes (Triphæna), 92
comitata (Pelurga), 261
comma (Augiades), 51, 282, 296
comma (Leucania), 114
comma-notata (Cidaria), 258, 287
communans (Cnephasia), 127
complana (Lithosia), 116, 220
concinna (Cidaria), 287
concolorata (Timoria), 109
conflua (Noctua), 33, 92
confusalis (Nola), 9
congener (Dyschorista), 115
conigera (Leucania), 114
connexa (Apamea), 141
consimiliana (Peronea), 39
consociella (Rhodophæa), 132
consonaria (Tephrosia), 200
consortaria (Boarmia), 80
conspersa (Dianthœcia), 33, 93
conspicillaris (Xylomyges), 93
constrictata (Eupithecia), 289
contigua (Mamestra), 93
contiguaria (Ptychopoda), 286
conturbatella (Mompha), 119
convolvuli (Herse), 146
convolvuli (Sphinx), 291
cordigera (Anarta), 161
coronata (Eupithecia), 261
coronula (Acronycta), 91
corticea (Agrotis), 32, 173
corydon (Agriades), 16, 19, 21, 22, 48, 51, 79, 80, 87, 98, 102, 119, 120, 123, 125, 292, 296, 297, 298
corylata (Cidaria), 208
coryli (Demas), 31
cosmodactyla (Platyptilia), 276
cossus (Cossus), 101
costæstrigalis (Hypenodes), 163
costalis (Habrosyne), 237
costovata (Xanthorhoë), 175, 258
crabroniformis (Trochilium), 200, 284
cracæ (Toxocampa), 162
cratægana (Tortrix), 15
cratægi (Aporia), 98, 219
cratægi (Trichiura), 85
cremonæ (Colias), 157, 251, 253
crenulata (Platyptilia), 275
crepuscularia (Tephrosia), 78, 283
cretaceus (Plebeius), 297
cribrum (Coscinia), 11
cribrumalis (Herminia), 163
crinaneensis (Gortyna), 113
crinaneensis (Hydræcia), 113, 141
cristalana (Peronea), 38
cristana (Peronea), 12, 35, 64, 79, 102, 299
croceus (Colias), 135, 150, 153, 184, 200, 242, 251, 279
crocoticta (Amyna), 237
**crystalina* (Eueides), 279
cucubali (Dianthœcia), 33
cuculla (Lophopteryx), 144, 221
cucullata (Anticlea), 288
cucullatella (Nola), 10
culiciformis (Sesia), 101
**cuneata* (Aricia), 249
cupreopuncta (Chrysophanus), 297
cupreopuncta (Rumicia), 126
cursoria (Agrotis), 91
curtisana (Peronea), 14, 39, 67
curzoni (Eupithecia), 289
cyanosticta (Vanessa), 20, 121
cydippe (Argynnis), 50, 51, 56, 80, 120, 145, 295
cynthia (Melitæa), 267
cyparissus (Glaucopsyche), 281
cytisi (Zygæna), 22
dahlia (Noctua), 33, 92
**daiseni* (Daimio), 181
dalella (Plutella), 90
dardanus (Papilio), 300
deannulata (Colias), 186, 253
debiliata (Eupithecia), 289
decoraria (Cosymbia), 286
deflexana (Cydia), 229
defoliaria (Hybernina), 45, 85, 118, 223, 283
degeneraria (Ptychopoda), 286
delamerensis (Tephrosia), 56
deleta (Aricia), 250
denotata (Eupithecia), 289
dentina (Mamestra), 33
deplana (Lithosia), 12, 116
depuncta (Noctua), 92
derivalis (Herminia), 163
deserticola (Colias), 157, 253
desfontainana (Peronea), 37

- designata* (*Coremia*), 258
destrigata (*Boarmia*), 283
didyma (*Melitea*), 80
didymata (*Malenydris*), 258
dieckmanni (*Habrosyne*), 238
diluta (*Asphalia*), 223
dilutata (*Euchloë*), 175
dilutata (*Oporabia*), 56, 79, 258
dimidiana (*Peridrina*), 101
dimidiata (*Ptychopoda*), 102, 207
dipsacea (*Heliothis*), 161
disa (*Erebia*), 266, 281
discordella (*Colephora*), 90
discreta (*Aricia*), 250
discreta (*Polyommatus*), 175
dispar (*Chrysophanus*), 16, 98, 149, 247, 303
dispar (*Ocneria*), 8
dispar (*Sciapteron*), 149
disparata (*Eupithecia*), 260
distinctaria (*Eupithecia*), 260, 289
distincta-scotica (*Mamestra*), 33
ditrapezium (*Noctua*), 92
divisa (*Colias*), 186, 253
dodoneata (*Eupithecia*), 261
doherlyi (*Mimacræa*), 300
dolabraria (*Eurymene*), 283
dominula (*Callimorpha*), 11
dorsana (*Stigmonota*), 89
dorsilunana, 229
dorus (*Cœnonymphe*), 124
doubledayaria (*Amphidasys*), 219, 300
dubitata (*Triphosa*), 208
dumerilii (*Luperina*), 141
duplana (*Evetria*), 89
duplex (*Colias*), 280
duplicana, 229
**dyala* (*Zegris*), 151
Eacles, 22
**eborina* (*Cybosia*), 12
eburnata (*Ptychopoda*), 286
edusa (*Colias*), 18, 19, 20, 21, 50, 51, 79, 80, 85, 88, 100, 121, 122, 124, 135, 150, 153, 184, 200, 242, 244, 251, 253, 279, 292
edwardsi (*Attacus*), 22
egeria (*Pararge*), 20, 86, 120, 123, 173, 247, 294, 296
egerides (*Pararge*), 20, 50, 51, 86, 120, 125, 173, 197, 296
**elena* (*Actinote*), 278
elinguaria (*Crocalis*), 283
emarginata (*Acidalia*), 56, 220
embla (*Erebia*), 281
emortualis (*Zanclognatha*), 163
ephialtes (*Zygæna*), 174
epiphron (*Erebia*), 57, 195
erate (*Colias*), 252
ericetaria (*Selidosema*), 284
eryphyle (*Colias*), 103
erythrocephala (*Orrhodia*), 143
erxia (*Euchloë*), 175
escheri (*Agriades*), 124
**ethiopica* (*Heodes*), 299
Eupheme (*Zegris*), 151
euphorbiæ (*Celerio*), 146
euphorbiæ (*Hylas*), 102, 247
euphrosyne (*Brenthis*), 50, 51, 79, 86, 100, 120, 122, 124, 172, 173, 197, 222, 281
europome (*Colias*), 154
europomene (*Colias*), 157
eurybia (*Heodes*), 247
eurytheme (*Colias*), 157
exanthemata (*Cabera*), 261
exclamationis (*Agrotis*), 32, 91
exigua (*Caradrina*), 142
exigua (*Laphygma*), 224
exiguata (*Eupithecia*), 261
exilis (*Brephidium*), 103
exoleta (*Calocampa*), 104, 115, 119, 120
exoleta (*Xylina*), 267
extensaria (*Eupithecia*), 289
extranea (*Leucania*), 79, 142
extrema (*Tapinostola*), 142
exulis (*Crymodes*), 90, 93
fabriciana (*Simæthis*), 225
fagella (*D.*), 147
fagi (*Stauropus*), 247
faillæ (*Colias*), 185, 251, 253
falcatoria (*Drepana*), 9
falcipennis (*Ozola*), 238
farinalis (*Pyralis*), 221
fasciata (*Lobophora*), 207
fasciata (*Miana*), 34
fasciuncula (*Miana*), 34
favicolor (*Leucania*), 142
favigora (*Ornix*), 117
ferrago (*Leucania*), 114
ferrea (*Amathes*), 115
ferrugata (*Coremia*), 258
ferruginia (*Xanthia*), 104
festuæ (*Plusia*), 116
fibrosa (*Helotropha*), 113
filigrammaria (*Oporabia*), 79
filipendulæ (*Zygæna*), 22, 80, 150, 152, 174, 272, 284, 295, 300
fimbria (*Triphæna*), 33
fimbriana (*Coccyx*), 126
fimbriolata (*Acidalia*), 207
final (*Brenthis*), 266, 281
finitima (*Apamea*), 34
flammatra (*Noctua*), 92
flammea (*Trigonophora*), 19, 141
flammeana (*Peronea*), 39
flava (*Adopæa*), 21, 51, 87, 120
flava (*Lithosia*), 12
**flavana* (*Oxigraphe*), 188
**flavana* (*Peronea*), 36, 67
flavescens (*Cybosia*), 12
flavescens (*Polyommatus*), 298
flavicincta (*Polia*), 223
flavicornis (*Cymatophora*), 56
flavicornis (*Polyplocæ*), 78
flavida (*Colias*), 157, 253
flavofasciata (*Perizoma*), 259
flavomarginata (*Nygma*), 274
flexula (*Laspeyria*), 163

- floslactata (*Acidalia*), 286
 fluctuata (*Xanthorhoë*), 85, 175, 198, 258, 287
 fluviata (*Cidaria*), 288
 formiciformis (*Sesia*), 117
 fowleri (*Agriades*), 21
 fracta (*Pyrameis*), 268
 fragilis (*Platyptilia*), 276
 fraternella (*Gelechia*), 119
 fraxinata (*Eupithecia*), 289
 fraxini (*Catocala*), 162, 244
 fraxini (*Zygæna*), 174
 freija (*Brenthis*), 265, 266, 281
 frigga (*Brenthis*), 266, 281
 fuciformis (*Hemaris*), 88, 200
 fuliginaria (*Parascotia*), 163
 fuliginosa (*Phragmatobia*), 10, 147
 fulva (*Tapinostola*), 113
 fulvago (*Xanthia*), 115
 *fulvana (*Peronea*), 37, 64
 fulvata (*Cidaria*), 208
 fulviguttella (*Cataplectica*), 118
 fulvocristana (*Peronea*), 39
 *fulvoliterana (*Oxigrapha*), 135, 158
 *fulvomaculana (*Oxigrapha*), 159
 fulvomixtana (*Oxigrapha*), 209
 fulvonigra (*Nygmaia*), 273
 *fulvopunctana (*Peronea*), 37
 fulvosignata (*Colias*), 157, 253
 fulvostriana (*Peronea*), 15, 35
 fulvovittana (*Peronea*), 39
 fumosa (*Agrotis*), 32
 fumosa (*Selidosema*), 284
 furcata (*Hydriomena*), 288
 furcifera (*Graptolitha*), 161
 furcula (*Cerua*), 103
 furva (*Hama*), 34, 141
 fuscana (*Peronea*), 38
 fuscatus (*Tæniocampa*), 114
 fuscicornis (*Platyptilia*), 276
 fusconebulosa (*Hepialus*), 90
 galactinus (*Cænonympha*), 102
 galatea (*Melanargia*), 19, 21, 50, 51, 56, 104, 122, 125, 303
 galiata (*Xanthorhoë*), 258
 gallicus (*Hepialus*), 90, 285
 gamma (*Plusia*), 87, 96, 116
 gemina (*Apamea*), 34
 geminipuncta (*Nonagria*), 218
 gemmaria (*Boarmia*), 217, 283
 gilvago (*Xanthia*), 56
 glareosa (*Noctua*), 32, 56, 92
 glauca (*Mamestra*), 33, 89, 93
 glicia (*Colias*), 198
 globulariæ (*Ino*), 79, 240
 glycera (*Dione*), 276
 glycerion (*Papilio*), 103
 gnaphalii (*Cucullia*), 161
 gnophota (*Dione*), 276
 gonerilla (*Pyrameis*), 238
 goossensata (*Eupithecia*), 260
 gothica (*Tæniocampa*), 85, 114, 142, 222
 gothicina (*Tæniocampa*), 114, 142
 gracilis (*Tæniocampa*), 115, 142
 graminis (*Charæas*), 34, 296
 *grandis (*Cogia*), 181
 grandis (*E.*), 22
 grisea (*Tæniocampa*), 115
 grisealis (*Zanclognatha*), 15, 206
 *griseana (*Oxigrapha*), 158
 grisearia (*Perconia*), 284
 griseata (*Lithostegia*), 286
 *griseisigna (*Eucampina*), 202
 griseola (*Lithosia*), 12, 56
 grossulariata (*Abraxas*), 52, 79, 175, 261, 301
 guenèii (*Luperina*), 141
 guiliaria (*Selenia*), 282
 gumpinana (*Peronea*), 39, 66
 haliphron (*Papilio*), 149
 halterata (*Lobophora*), 55, 207
 hastata (*Eulyte*), 200, 259
 hastata (*Melanippe*), 55, 104
 hastiana (*Peronea*), 150, 188
 hastiana (*Tortrix*), 16, 102
 *hawkeri (*Clanis*), 106
 haworthiata (*Eupithecia*), 260
 haworthii (*Celæna*), 34
 hebridicola (*Agrotis*), 32
 hecla (*Colias*), 265, 280, 281
 hectus (*Hepialus*), 285
 hecuba (*Ornithoptera*), 272
 heegeriella (*Lithocolletis*), 90
 hela (*Brenthis*), 281
 heldreichii (*Colias*), 186, 280
 helena (*Colias*), 185, 253
 helice (*Colias*), 18, 21, 51, 79, 80, 136, 150, 158, 252, 253, 280, 292
 helicina (*Colias*), 136, 154, 187, 253
 heliconioides (*Eueides*), 279
 helops (*Cecheneia*), 108
 helveticaria (*Eupithecia*), 90, 289
 helvola (*Amathes*), 115
 helvola (*Lithosia*), 12
 hepatica (*Xylophasia*), 35
 herbariata (*Ptychopoda*), 286
 hermanella (*Aristotelia*), 119
 hermione (*Satyrus*), 123
 heroldella (*Swammerdamia*), 118
 hethlandica (*Dianthæcia*), 93
 hexadactyla (*Orneodes*), 274
 hibernica (*Euchloë*), 175
 hippocastanaria (*Pachynemina*), 220
 hippocrepidia (*Zygæna*), 174, 200, 272, 295
 hippothoë (*Chrysophanus*), 282
 hippothoë (*Heodes*), 247
 hispidaria (*Apocheima*), 85
 hispidaria (*Nyssia*), 56, 103, 223
 hispulla (*Epinephele*), 52, 80, 299
 histrionica (*Noctua*), 267
 histrionica (*Prodenia*), 267
 holosericata (*Ptychopoda*), 286
 homerus (*Papilio*), 222
 huebneri (*Orneodes*), 275
 humiliata (*Ptychopoda*), 286
 humuli (*Hepialus*), 284
 hutchinsoni (*Polygonia*), 117

- hyale (*Colias*), 19, 51, 79, 135, 241, 242, 251, 270, 292
 hyemalis (*Boreus*), 272
 hyperanthus (*Aphantopus*), 51, 80, 87, 100, 120, 200, 296
 hyperborea (*Agrotis*), 92
 hypophleas (*Chrysophanus*), 266, 282
 ianira (*Epinephele*), 299
 ianthina (*Triphæna*), 33
 icarinus (*Polyommatus*), 175, 298
 icarus (*Polyommatus*), 21, 51, 79, 87, 100, 102, 103, 120, 152, 174, 175, 197, 240, 281, 296, 298
 ida (*Epinephele*), 124
 iduna (*Melitæa*), 266, 281
 ignita (*Rumiccia*), 300
 ilicifolia (*Gastropacha*), 9
 ilicis (*Nordmannia*), 300
 illustraria (*Selenia*), 291
 immanata (*Cidaria*), 208, 287, 289
 immorata (*Acidalia*), 79, 286
 immutata (*Acidalia*), 144
 impar (*Bryophila*), 91
 imperialis (*E.*), 22
 impluviata (*Hydriomena*), 259
 impressa (*Lælia*), 273
 impura (*Leucania*), 114
 incarnata (*Theretra*), 108
 incerta (*Tæniocampa*), 114, 142
 indica (*Pyrameis*), 269
 *indigata (*Amyna*), 237
 indigata (*Eupithecia*), 245, 260
 infuscata (*Acronycta*), 91
 infuscata (*Camptogramma*), 259
 infuscata (*Xylophasia*), 35
 innotata (*Eupithecia*), 289
 ino (*Brenthis*), 281
 inornata (*Acidalia*), 207
 insignata (*Eupithecia*), 288
 instabilis (*Tæniocampa*), 114
 insulana (*Peronea*), 38, 65
 interjecta (*Triphæna*), 117
 intermedia (*Chrysophanus*), 297
 intermedia (*Rumiccia*), 300
 *intermedia-fumosa (*Selidosema*), 151, 284
 intermediana (*Peronea*), 38
 internodimidiata (*Colias*), 186, 253
 *interposita (*Cecheneæ*), 108
 interrogationis (*Plusia*), 116, 162
 *interrupta (*Papilio*), 180
 interruptana, 229
 inŭrbata (*Eupithecia*), 144
 io (*Vanessa*), 19, 20, 21, 50, 51, 86, 100, 119, 122, 148, 173, 175, 292, 295
 iota (*Plusia*), 116
 iris (*Apatura*), 24, 79
 irregularis (*Dianthœcia*), 93
 irriguata (*Eupithecia*), 288
 irrorana (*Oxigrapta*), 135, 160, 189
 isis (*Brenthis*), 266, 281
 itea (*Vanessa*), 239
 jacobææ (*Hipocrita*), 12, 272
 jansoniana (*Peronea*), 39, 66
 janthinana (*Laspeyresia*), 118
 japonica (*Papilio*), 244
 jasionæata (*Eupithecia*), 289
 jehana (*Tajuria*), 206
 *jöra (*Colias*), 265
 juncta (*Plusia*), 116
 juniperata (*Thera*), 104
 jurtina (*Epinephile*), 20, 21, 51, 52, 79, 80, 87, 100, 117, 120, 125, 197, 294, 296, 301
 jutta (*Eneis*), 281
 klemensiewiczzi (*Pyrameis*), 268
 lacertinaria (*Drepana*), 9, 126
 lactearia (*Iodis*), 53, 207
 lacteola (*Lithosia*), 12
 laertes (*Morpho*), 174
 laeta (*Misurgina*), 150
 lapidata (*Phibalapteryx*), 90, 289
 lappona (*Erebia*), 265, 281
 lapponaria (*Nyssia*), 89
 lapponica (*Brenthis*), 265, 281
 lapponica (*Colias*), 281
 lariciata (*Eupithecia*), 52, 260
 larus (*Libythea*), 222
 lathonia (*Issoria*), 244
 lathyra, 229
 lathyri (*Epithestis*), 90
 latifasciata (*Oporabia*), 258
 latruncula (*Miana*), 34
 lavatera (*Hysperia*), 200
 lefebvrei (*Erebia*), 80
 leguminana (*Cydia*), 225
 *leighi (*Nephele*), 107
 lenæus (*Papilio*), 180
 leporina (*Acronycta*), 31, 90
 leucographa (*Pachnobia*), 142
 leucophæa (*Pachetra*), 98, 219
 leucophæaria (*Hybernica*), 22, 85, 223
 leucostigma (*Helotropha*), 113
 libatrix (*Scoliopteryx*), 116
 lichenana (*Peronea*), 12, 65, 102
 lichenaria (*Cleora*), 283, 293
 lienigianus (*Pterophorus*), 276
 ligea (*Erebia*), 281
 lignea (*Blastobasis*), 199
 ligniperda (*Cossus*), 79
 ligula (*Orrhodia*), 115
 ligustri (*Acronycta*), 91
 ligustri (*Sphinx*), 80, 200, 300
 limitata (*Ortholitha*), 207
 lineola (*Coleophora*), 117
 linus (*Pterophorus*), 276
 literana (*Leptogramma*), 79
 literana (*Oxigrapta*), 129, 157, 173, 187, 196, 209, 299
 literosa (*Miana*), 34
 lithargyria (*Leucania*), 114
 lithoxylea (*Xylophasia*), 34
 littoralis (*Noctua*), 267
 litura (*Noctua*), 267
 litura (*Prodenia*), 267
 liturata (*Semiothisa*), 283
 livornica (*Deilephila*), 146
 livornica (*Phryxus*), 51, 175

- logæa (Evetria), 89
 longipennis (Hypena), 204
 loniceræ (Zygæna), 150, 152, 284
 lota (Amathes), 115
 lubricipeda (Spilosoma), 10
 lucens (Hydræcia), 113, 141
 lucernea (Agrotis), 292
 lucina (Nemeobius), 51, 120, 122, 196, 197
 lucipara (Euplexia), 113
 luctifera (Heise), 109
 luctuosa (Acontia), 55
 luneburgensis (Aporophyla), 141
 lupulinus (Hepialus), 285
 lutea (Xanthia), 115
 luteolata (Opisthograptis), 283
 lutosæ (Calamia), 114
 lutulenta (Aporophyla), 141
 *luzonensis (Hypena), 203
 lychnidis (Amathes), 115, 144
 lychnitis (Cucullia), 20, 161
 lycidas (Plebeius), 49
 maacki (Papilio), 244
 maccana (Peronea), 102
 machaon (Papilio), 17, 54, 55, 79, 98, 151, 281
 macilenta (Amathes), 115
 macrops (Grishna), 22
 magnifica (Eastes), 247
 majalis (Papilio), 244
 major (Bithys), 102
 major (Colias), 280
 major (Hipparchia), 124
 malvæ (Hesperia), 51, 56, 87, 97, 120, 148, 195, 197, 200, 218, 241
 malvoides (Hesperia), 97
 mantissa (Pyralis), 157
 manto (Erebia), 80
 *manuselensis (Theretra), 108
 margaritaria (Metrocampa), 261
 marginaria (Hybernica), 223, 283
 marginata (Agriades), 298
 marginata (Lomaspilis), 261
 maritima (Senta), 55, 141
 marmarodactyla (Platyptilia), 276
 marmorata (Cidaria), 208, 287
 marshalli (Mimacræa), 300
 masoniana (Peronea), 39, 67
 matronalis (Parasemia), 151
 matura (Cerigo), 34
 maturna (Melitæa), 267
 maura (Mormo), 113
 mauretanica (Celerio), 146
 mediterranea (Colias), 140
 medon (Aricia), 51, 79, 80, 121, 125, 296, 298
 medusa (Erebia), 281
 megacephala (Acronycta), 31
 megæra (Pararge), 19, 20, 50, 51, 86, 100, 120, 123, 125, 173, 197, 269, 292, 293, 294, 296
 melaleuca (Xylomyges), 93
 melanitica (Colias), 184, 253
 melanocephala (Acronycta), 90
 melanopa (Anarta), 161
 melanotoxa (Polyommatus), 298
 mendica (Diaphora), 10
 menestho (Zegris), 151
 menthastri (Spilosoma), 10, 104, 200
 menyanthidis (Acronycta), 32
 merlana (Peronea), 38
 mesomella (Cybosia), 12, 79
 mesopotamica (Zephyrus), 199
 *metallica (Orses), 183
 meticulousa (Phlogophora), 113, 147
 metra (Pieris), 172
 mi (Euclidia), 116
 miata (Cidaria), 208
 micacea (Hydræcia), 113, 144
 micans (Colias), 185, 253, 280
 microclea (Heliconius), 151
 minimus (Cupido), 21, 51, 125, 200, 296, 297
 miniosa (Tæniocampa), 196, 223
 minor (Colias), 136, 158, 186, 253, 280
 minor (Polyommatus), 298
 *mixtana (Oxigrapha), 135, 161, 189
 monacha (Lymantria), 8
 monacharia (Phigalia), 101, 103
 moneta (Dione), 276
 monoglypha (Xylophasia), 35
 montana (Alucita), 275
 montanata (Xanthorhoë), 200, 258, 288
 mori (Bombyx), 55
 morpheus (Caradrina), 114
 morpheus (Heteropterus), 80
 multistrigaria (Malenydris), 258
 multistrigaria (Xanthorhoë), 118
 munda (Tæniocampa), 115, 143
 munitata (Coremia), 208
 muralis (Bryophila), 91
 muscerda (Lithosia), 12
 musculosa (Synia), 142
 myellus (Crambus), 90
 myopæformis (Sesia), 196
 myrtilli (Anarta), 116
 nanata (Eupithecia), 261
 napi (Pieris), 20, 21, 22, 51, 80, 100, 104, 119, 122, 147, 173, 197, 201, 281, 300
 nastes (Colias), 281
 navarina (Melitæa), 300
 nebulosa (Aplecta), 33, 92
 *nebulosa (Hypena), 204
 nebulosus (Noctua), 56
 neglecta (Noctua), 56
 neria (Eresia), 279
 nerii (Daphnis), 146
 ni (Plusia), 162
 nictitans (Hydræcia), 113
 nigra (Aporophyla), 35, 90
 nigra (Epunda), 223
 nigrana (Peronea), 39
 nigrescens (Dyschorista), 115
 nigrescens (Luperina), 34
 nigricans (Agrotis), 32, 91
 nigricans (Zygæna), 272
 nigra (Limenitis), 88
 nigrocostana (Peronea), 38, 65
 nigrocristana (Peronea), 38
 nigrofasciaria (Anticlea), 260

- nigrofasciata (Colias), 185, 253
 *nigromaculana (Oxigrapha), 135, 209
 nigropunctana (Peronea), 16, 35, 64
 nigropunctata (Acidalia), 286
 *nigropunctata (Pieris), 125
 nigrosubrosea (Cosymbia), 80, 286
 nigrosubvittana (Peronea), 38
 nimbanda (Catoptria), 302
 *nitida (Lælia), 273
 niveana (Peronea), 188
 norna (Eneis), 265, 281
 notabilis (Heliconius), 151
 notata (Macaria), 55
 notatana (Oxigrapha), 157
 nupta (Catocala), 162
 obelisca (Agrotis), 91
 obeliscata (Thera), 208, 301
 obliterata (Rumicia), 300
 obliterata (Thera), 208
 oblongata (Eupithecia), 260
 obscura (Agrotis), 20, 56, 92
 obscura (Grammesia), 114
 obscura (Zygæna), 272
 obscurata (Hybernia), 283
 obscuripunctella (Perittia), 90
 obsitalis (Hypena), 204
 obsoleta (Colias), 185, 253, 280
 obsoleta (Cosymbia), 286
 obsoleta (Leucania), 142
 obsoleta (Rumicia), 300
 obsoleta (Zephyrus), 125
 obstipata (Cidaria), 288
 occulta (Eurois), 92
 ocellaris (Mellinia), 143
 ocellata (Mesoleuca), 259
 ocellatus (Smerinthus), 80, 147
 ochracea (Ochria), 113
 ochrata (Ptychopoda), 286
 ochreana (Peronea), 39, 67
 ochreapunctana (Peronea), 35
 ochreola (Lithosia), 12
 ochroleuca (Eremobia), 140
 octogesima (Cymatophora), 56
 ocularis (Cymatophora), 85
 œdipus (Cœnonympha), 80
 oleagina (Valeria), 140
 oleracea (Mamestra), 33
 olivacea (Polia), 22
 ononaria (Aplastis), 285
 oo (Dicycla), 142
 ophiogramma (Apamea), 34, 141
 opima (Tæniocampa), 115, 142, 222
 optilete (Glaucopsyche), 282
 orbicularia (Cosymbia), 286
 orbiculoides (Cosymbia), 286
 orbitulus (Latorina), 282
 orbona (Triphæna), 33, 92
 orion (Diptera), 88
 Orneodes, 274
 osseata (Ptychopoda), 286
 ossianus (Brenthis), 266, 281
 otregiata (Cidaria), 52
 otregiata (Lampropteryx), 52
 oxyacanthæ (Lithocolletis), 117
 oxyacanthæ (Miselia), 35
 pabulatricula (Apamea), 141
 palæno (Colias), 157, 281
 paleacea (Cosmia), 142
 palealis (Spilodes), 302
 pales (Brenthis), 266, 281
 pallens (Leucania), 114
 pallida (Agrotis), 32
 pallida (Colias), 136, 158, 253
 pallida (Drepana), 9
 pallida (Tæniocampa), 115
 paludata (Carsia), 56
 paludis (Hydræcia), 113, 141
 palustraria (Eupithecia), 288
 pampilius (Cœnonympha), 20, 51, 56,
 100, 102, 120, 121, 125, 175, 197, 242,
 290, 294, 296
 paphia (Dryas), 21, 44, 50, 51, 56, 70,
 80, 88, 120, 122, 124, 145, 197, 295
 papilionaria (Geometra), 207, 285
 papuana (Cecheneia), 108
 *papuensis (Theretra), 108
 parisiensis (Agiæda), 298
 parthenias (Brepheos), 147, 301
 parva (Thalpocharis), 162
 parvipuncta (Chrysophanus), 102
 parvipuncta (Plebeius), 175
 parvipuncta (Rumicia), 300
 pascuellus (Crambus), 15
 passa (Colias), 157, 253
 pavonia (Saturnia), 118, 220
 pedaria (Phigalia), 85, 101, 103, 283
 peltigera (Heliothis), 51, 164
 pendularia (Cosymbia), 80, 286
 pendularia (Ephyra), 207
 pennaria (Himera), 56, 282
 penziana (Sciaphila), 104
 percontationis (Plusia), 116
 perfusca (Noctua), 33
 perfusca (Cidaria), 208
 perisa (Actinote), 278
 perla (Bryophila), 91, 223
 perlepidana (Acrolepia), 117
 perlepidana (Laspeyresia), 229
 perochraria (Ptychopoda), 286
 perseæ (Melitæa), 151
 *peruviana (Pachygonia), 107
 petraria (Lozogramma), 284
 *philippensis (Nygma), 274
 phlæas (Chrysophanus), 17, 21, 51, 87,
 100, 101, 102, 117, 118, 119, 121, 125,
 126, 147, 241, 242, 268, 270, 282, 293,
 296
 phlæas (Heodes), 299
 phlæas (Rumicia), 22, 78, 79, 80, 175,
 200, 300, 301
 phœbe (Melitæa), 79, 97
 pica (Ozola), 238
 picata (Euphyia), 102, 288
 piceata (Lampropteryx), 208
 pilleriana (Oxigrapha), 187
 pilosaria (Phigalia), 85
 piniaria (Bupalus), 283
 pinastri (Hyloicus), 77

- pinastri (Sphinx), 22
 pinguinalis (A.), 15
 pini (Eupithecia), 288
 piniaria (Bupalus), 22
 piniperda (Panolis), 114, 199
 pisi (Mamestra), 33
 plagiata (Anaitis), 207
 plantaginis (Nemophila), 293
 plantaginis (Parasemia), 11, 151, 292
 plecta (Noctua), 33
 plexippus (Anosia), 146, 210
 plumaria (Selidosema), 151
 plumbaria (Ortholitha), 89, 207
 plumbata (Mesoleuca), 259
 plumbeolata (Eupithecia), 55, 260
 plumigera (Ptilophora), 144, 200
 podalirius (Papilio), 54, 200, 247
 poeyii (Dione), 276
 polaris (Aglais), 280
 polaris (Brenthis), 281
 polaris (Erebia), 265, 281
 politana (Lophoderus), 101
 pollutaria (Lomaspilia), 261
 pollux (Erebia), 265, 281
 polychloros (Eugonia), 50, 51, 119, 122, 197, 295
 polygrammata (Euphyia), 288
 popularis (Epineuronia), 34
 populata (Lygris), 208
 populi (Amorpha), 80
 porata (Ephyra), 22
 poseidon (Ornithoptera), 272
 postchantana (Peronea), 38, 65
 potatoria (Cosmotriche), 80
 potatoria (Odonestis), 56
 præcox (Agrotis), 91
 præcurrens (Nygmia), 274
 prasina (Eurois), 33
 prasinana (Hylophila), 148
 pratellus (Crambus), 15
 *pratti (Clanis), 105
 priamus (Ornithoptera), 272
 primulæ (Noctua), 33, 92
 proboscidalis (Hypena), 206
 prochantana (Peronea), 38, 64
 procrystalana (Peronea), 39, 66
 prodomana (Philedone), 101, 173
 prodromaria (Pachys), 175
 profanana (Peronea), 15, 38, 65
 profundana (Eucosma), 117
 pronuba (Triphæna), 33, 175, 199, 271
 propinquella (Mompha), 117
 prosapiaria (Ellopiæ), 261
 prostriana (Peronea), 38, 64, 65
 protea (Eumichtis), 34
 provittana (Peronea), 14, 36, 65
 proxanthovittana (Peronea), 14, 37, 64
 pruinata (Pseudoterpna), 207
 prunata (Lygris), 208
 pruni (Strymon), 200
 pruni (Thecla), 19, 85
 pseudathalia (Melitæa), 97
 pseudomas (Colias), 280
 psi (Acronycta), 32
 pudorina (Leucania), 56
 pulchella (Deiopeia), 11, 146, 270, 291, 298
 pulchellata (Eupithecia), 260
 pulcherrimella (Depressaria), 90
 pulchrina (Plusia), 116, 118
 pulveraria (Numeria), 261
 pulverulenta (Tæniocampa), 143
 pumilata (Eupithecia), 144, 261
 puncta (Polyommatus), 241
 punctalis (Stenia), 117
 punctana (Peronea), 38
 punctaria (Ephyra), 22
 punctata (Agriades), 298
 pupilana (Catoptria), 117
 purdeyana (Peronea), 39, 66
 purpuralis (Pyrausta), 174
 purpurascens (Colias), 280
 pusaria (Cabera), 261
 pusillata (Eupithecia), 144
 puta (Agrotis), 293
 putrescens (Leucania), 142
 putris (Axylia), 33
 pygmæata (Eupithecia), 260, 288
 pyraliata (Cidaria), 208
 pyralina (Calymnia), 142
 pyramidea (Amphipyra), 114, 173
 pyrenaica (Colias), 137, 186, 253
 quadrifasciaria (Xanthorhoë), 288
 quadripunctata (Caradrina), 114
 quercifolia (Gastropacha), 296
 quercinaria (Ennomos), 282
 quercus (Bithys), 102, 200
 quercus (Lasiocampa), 9, 118
 quercus (Zephyrus), 51, 88, 125, 199, 296, 297
 radiata (Chiasma), 214
 radiata (Rumicia), 300
 radiata (Spilosoma), 10
 rapæ (Pieris), 20, 21, 22, 51, 79, 85, 100, 119, 121, 122, 124, 125, 126, 147, 150, 172, 173, 175, 197, 201, 295
 ravidæ (Agrotis), 20
 rectangulata (Chloroclystis), 261
 remutaria (Acidalia), 286
 renago (Dicycla), 142
 repandata (Boarmia), 283
 resinella (Evetria), 89
 reticulata (Eustroma), 286
 reticulata (Neuria), 93, 143
 retiella (Whittleia), 302
 retusa (Plastenis), 143
 revayana (Sarothripus), 10, 56
 rex (Papilio), 300
 rhamni (Gonepteryx), 50, 51, 79, 85, 119, 121, 122, 123, 124, 147, 173, 292, 295
 rhododactylus (Platyptilia), 220
 rhombalis (Hypena), 204
 ribbei (Pachygonia), 107
 ricini (Eueides), 279
 ridens (Polyplocia), 117
 ridicula (Colias), 154
 ripæ (Agrotis), 91

- rivata (*Xanthorhoë*), 246
 roboraria (*Boarmia*), 143
 robsoni (*Aplecta*), 92
 romanana (*Oxigrapta*), 135, 157
 rosea (*Agrotis*), 32
 rosea (*Tæniocampa*), 115
 rosea (*Xylocampa*), 115
 rossica (*Callimorpha*), 11
 ruberata (*Hydriomena*), 259
 rubi (*Bombyx*), 117
 rubi (*Callophrys*), 51, 100, 120, 148, 173,
 197, 199, 200, 297
 rubi (*Macrothylacia*), 9, 220
 rubi (*Noctua*), 33
 rubiginata (*Acidalia*), 286
 rubiginea (*Orrhodia*), 143
 rubricosa (*Pachnobia*), 114
 rufa (*Cænobia*), 221
 rufa (*Dyschorista*), 115
 rufa (*Tæniocampa*), 115
 rufa (*Triphæna*), 33, 92
 rufescens (*Calamia*), 114
 rufescens (*Tæniocampa*), 115, 142
 ruficostana (*Peronea*), 13, 38, 64, 65
 rufina (*Anchocelis*), 223
 rufinigrina (*Peronea*), 38
 rufopunctata (*Papilio*), 151
 rumicis (*Acronycta*), 32, 91
 rumina (*Thais*), 200
 rupicaprararia (*Hybernaria*), 283
 rurea (*Xylophasia*), 34
 rustica (*Diaphora*), 10
 rustica (*Phlegethontius*), 199
 rutilus (*Chrysophanus*), 149, 247
 rutilus (*Papilio*), 103
 sacraria (*Rhodometra*), 286
 sagittata (*Cidaria*), 288
 salicalis (*Madopa*), 163
 salicata (*Malenydris*), 258
 salicella (*Cheimophila*), 117
 salicella (*Dasystoma*), 117
 salicis (*Acronycta*), 32, 91
 salmactis (*Aricia*), 249
 sambucalis (*Ebulea*), 293
 sambucaria (*Ourapteryx*), 269, 271, 283
 sanio (*Diacrisia*), 11, 220, 293
 sara (*Anthocharis*), 103
 satellitia (*Scopelosoma*), 104, 115
 satura (*Eumichtis*), 93
 satyrata (*Eupithecia*), 260, 289
 saucia (*Agrotis*), 32
 saucia (*Eupsilia*), 143
 saucia (*Peridromia*), 104
 saxifragæ (*Zelleria*), 90
 scandinavica (*Erebia*), 281
 scandinavica (*Pieris*), 281
 schmidtii (*Chrysophanus*), 242, 296
 schreibersiana (*Phtheochroa*), 227
 scincula (*Drepana*), 9
 scintillans (*Nygmia*), 274
 scoliiformis (*Lesia*), 301
 scoparia (*Agrotis*), 32
 scotica (*Acronycta*), 32
 scutulata (*Ptychopoda*), 102
 secalis (*Apamea*), 34
 segetum (*Agrotis*), 32, 91, 148, 293
 selene (*Brenthis*), 17, 50, 56, 86, 100,
 117, 120, 122, 147, 243, 269, 281, 293
 semele (*Hipparchia*), 20, 51, 79, 100,
 101, 120, 296
 semele (*Satyrus*), 79
 semi-allous (*Aricia*), 249
 semiargus (*Nomiades*), 281
 semibrunnea (*Lithophane*), 161
 semicostella (*Sophronia*), 119
 semidivisa (*Colias*), 186, 253
 semi-obsoleta (*Agriades*), 125
 semi-obsoleta (*Colias*), 186, 253
 semistriana (*Peronea*), 39, 66
 semisynggrapha (*Agriades*), 16, 125
 semiustana (*Peronea*), 15, 37
 senex (*Nudaria*), 144
 sepiana (*Peronea*), 16
 sequana (*Peronea*), 16, 36, 102
 serena (*Hecatera*), 34
 seriata (*Colias*), 186, 253
 sericana (*Peronea*), 35
 sericea (*Lithosia*), 12
 sericealis (*Rivula*), 116
 serpentata (*Ptychopoda*), 286
 sexualisata (*Lobophora*), 208
 shastæ (*Platyptilia*), 276
 shetlandica (*Xanthorhoë*), 258
 sibylla (*Limenitis*), 19, 44, 50, 51, 55, 70,
 76, 80, 86, 88, 120, 122, 197
 sicula (*Drepana*), 9
 siliaceata (*Eustroma*), 208
 similis (*Porthesia*), 219, 269, 270, 293,
 301
 similis (*Agrotis*), 91
 sinapis (*Leptosia*), 79, 124, 197
 sinelinea (*Leucania*), 142
 sinuana (*Pædisca*), 104
 siterata (*Cidaria*), 208
 sobrina (*Noctua*), 92
 socia (*Lithophane*), 115, 161
 sociata (*Epirrhoë*), 288
 sociata (*Xanthorhoë*), 53, 246, 258
 solutella (*Gelechia*), 90
 sordidata (*Hydriomena*), 259
 sororcula (*Lithosia*), 12
 *southiana (*Peronea*), 36
 spadiceana (*Peronea*), 38
 sparganii (*Nonagria*), 141
 sparsana (*Tortrix*), 16
 spartiata (*Chesias*), 207
 sphinx (*Asteroscopus*), 118
 spini (*Klugia*), 300
 splendens (*Mamestra*), 33
 spoliata (*Acidalia*), 207
 sponsa (*Catocala*), 88
 sponsana (*Peronea*), 188
 squamana (*Oxigrapta*), 159, 160, 188,
 209
 squamulana (*Oxigrapta*), 136, 157, 188,
 189, 210
 stabilis (*Tæniocampa*), 114
 statice (*Ino*), 56, 284

- steinerti (Acronycta), 173
 stellatarum (Macroglossa), 117, 118, 146
 stieberi (Chrysophanus), 282
 straminealis (Evergestis), 283
 straminata (Acidalia), 220
 straminata (Ptychopoda), 286
 straminea (Leucania), 56, 144
 strataria (Pachys), 85, 173, 175, 283
 striana (Peronea), 35, 38
 striata (Colias), 185, 251, 253
 striata (Coscinia), 11
 strigilis (Miana), 34
 strigillaria (Acidalia), 286
 strigillaria (Aspilates), 220
 strigillaria (Perconia), 284
 strigosa (Acronycta), 24, 91
 strigula (Agrotis), 32
 strigula (Nola), 9
 suavana (Oxigrapta), 209
 subalboflammana (Peronea), 38, 64
 subcapucina (Peronea), 39, 66
 subchantana (Peronea), 38, 102
 subcristalana (Peronea), 39
 subfulvata (Eupithecia), 260
 subfulvovittana (Peronea), 39
 sublustris (Xylophasia), 35, 143
 subnigrana (Peronea), 39
 subobsoleta (Colias), 185, 253
 subochreatea (Cosymbia), 286
 subradiata (Chrysophanus), 76, 126
 subradiata (Rumicia), 78, 126
 subrosea (Noctua), 92
 subroseata (Cosymbia), 286
 subsequa (Triphæna), 92
 subsericeata (Acidalia), 56
 substriana (Peronea), 38, 65
 subsuffusa (Agriades), 298
 *subterminalis (Nagia), 203
 subtusa (Plastenis), 90, 143
 subunicolorana (Peronea), 38, 65
 subvittana (Lithosia), 12
 subvittana (Peronea), 38
 succenturiata (Eupithecia), 260
 suffumata (Lampropteryx), 208, 290
 suffusa (Colias), 185, 253, 279
 suffusa (Dianthœcia), 33
 suffusa (Leucania), 114
 suffusa (Miana), 34
 suffusa (Rumicia), 300
 suffusa (Xanthia), 115
 *suffusana (Oxigrapta), 135, 160
 sumatrensis (Cechenea), 109
 surima (Actinote), 278
 susinella (Cemiosoma), 90
 suspecta (Dyschorista), 115
 sylvanus (Agriades), 51, 87, 100, 120, 197
 syngrapha (Agriades), 16, 48, 98
 syrichtus (Hesperia), 80
 syringaria (Hygrochroa), 78
 tæniaalis (Hypenodes), 163
 tæniata (Perizoma), 259, 288
 tages (Nisoniades), 51, 54, 79, 100, 119,
 123, 125, 173, 218, 240, 241, 293, 296
 tages (Thanaos), 54, 197
 taraxaci (Caradrina), 114
 tarsipennalis (Zanclognatha), 206
 temerata (Bapta), 261
 tenebrosa (Rusina), 114
 tenuiata (Eupithecia), 260
 tergestina (Colias), 155
 Terias, 22
 terminalis (Miana), 34
 testacea (Luperina), 34, 140
 testata (Lygris), 208
 tetralunaria (Selenia), 79, 175, 291
 thalassina (Mamestra), 33
 thaos (Papilio), 247
 thetis (Agriades), 80, 247
 thetis (Chrysophanus), 123
 thetys (Daimio), 181
 thingvallata (Cidaria), 208, 287, 290
 thompsoni (Aplecta), 92
 thore (Brenthis), 281
 thulei (Noctua), 92
 tilix (Mimas), 78, 175
 Timoria, 109
 tincta (Aplecta), 92
 tincta (Epinephele), 52
 tineana (Ancyliis), 302
 tiphon (Cœonympha), 56, 100, 125, 147
 tipuliformis (Sesia), 224
 tithonus (Agriades), 48
 tithonus (Epinephele), 20, 50, 51, 79,
 86, 100, 120, 296, 301
 tityus (Hemaris), 88
 togata (Eucymatoge), 90
 togata (Eupithecia), 288
 tolana (Peronea), 14, 36, 66
 trabealis (Emmelia), 162
 tragopogonis (Amphipyra), 114
 transalpina (Zygæna), 174
 transversana (Peronea), 38, 65
 trapezina (Calymnia), 115
 trapezina (Cosmia), 143
 treueriana (Peronea), 188
 triangulum (Noctua), 32
 tricolorana (Oxigrapta), 135, 158, 159
 tridens (Acronycta), 32
 trifolii (Pachygastria), 9
 trifolii (Zygæna), 22, 79, 80, 104, 150,
 174, 175, 200, 272, 295
 trigrammica (Grammesia), 114
 trimaculella (Nepticula), 117
 tripartita (Abrostola), 116
 triplasia (Abrostola), 116
 tripuncta (Acompia), 118
 tripunctaria (Eupithecia), 289
 trisignaria (Eupithecia), 289
 tritici (Agrotis), 32, 91
 trivia (Melitea), 151
 truncata (Cidaria), 79, 208, 287
 truncata (Dysstroma), 79, 80
 truncicolella (Scoparia), 117
 tschudica (Zegris), 151
 turbaria (Perizoma), 259
 тура (Leucania), 142
 turcica (Rumicia), 300
 turfosalis (Tholomiges), 163, 221

- tutti (*Zygæna*), 272
 tyndarus (*Erebia*), 247
 typhæ (*Nonagria*), 113, 218
 typica (*Nænia*), 113
 udana (*Eupeçilia*), 219
 ulmella (*Scoparia*), 51
 ulotana (*Peronea*), 35
 umbratica (*Cucullia*), 115
 umbrosa (*Lithophane*), 115
 umbrosa (*Noctua*), 33
 unangulata (*Euphyia*), 288
 unangulata (*Xanthorhoë*), 147, 258
 unanimis (*Apamea*), 34
 uncula (*Hydrelia*), 116
 undulata (*Eucosmia*), 203
 unicolorana (*Peronea*), 14, 38, 64
 unicolorata (*Ematurga*), 300
 unicolorata (*Malenydris*), 258
 unidentaria (*Coremia*), 148, 208
 unilobata (*Xanthorhoë*), 258
 unionalis (*Glyphodes*), 20
 unionalis (*Margarodes*), 20, 76, 102, 150, 292
 unipuncta (*Leucania*), 79, 142, 224
 upsilon (*Agrotis*), 91
 urticæ (*Aglais*), 18, 21, 50, 51, 56, 86, 119, 122, 123, 125, 147, 173, 281, 289, 292, 295
 urticæ (*Spilosoma*), 270
 *ustulana (*Peronea*), 37
 utahensis (*Arctia*), 238
 vaccinii (*Cerastis*), 175
 vaccinii (*Orrhodia*), 115
 valesina (*Argynnis*), 104
 valesina (*Dryas*), 44, 56, 145, 295
 variata (*Thera*), 144, 287, 301
 *variegata (*Hypena*), 204
 varleyata (*Abraxas*), 79
 vaughaniana (*Peronea*), 38, 64, 65
 vedræ (*Aricia*), 249
 velata (*Colias*), 185, 253
 velleda (*Hepialus*), 285
 venosata (*Eupithecia*), 260, 289
 venustula (*Erastria*), 162
 *verecundus (*Thracides*), 182
 vernalis (*Colias*), 137, 186, 253
 vernalis-aubuissoni (*Colias*), 136
 vernaria (*Geometra*), 207
 vestigialis (*Agrotis*), 32, 91
 vestigialis (*Euxoa*), 32
 vetusta (*Calocampa*), 115, 293
 villica (*Arctia*), 147, 300
 viminalis (*Epunda*), 56
 vinula (*Dicranura*), 144
 viretata (*Lobophora*), 207
 virgata (*Malenydris*), 258
 virgaureæ (*Heodes*), 247
 virgaureæ (*Sciaphila*), 117
 virgaureana (*Tortrix*), 117
 virgaureata (*Eupithecia*), 289
 virgularia (*Acidalia*), 293
 viridana (*Tortrix*), 45, 120, 133, 143, 197
 viridaria (*Amœbe*), 258
 vishna (*Trebala*), 22
 vitellina (*Leucania*), 20, 142
 vittata (*Cœnocalpe*), 261
 w-album (*Thecla*), 98
 wauaria (*Thamnonoma*), 284
 *webbiana (*Peronea*), 37
 werdandi (*Colias*), 264, 281
 wildei (*Oxyambulyx*), 105
 wiskotti (*Arctia*), 238
 wismariensis (*Senta*), 141
 xanthe (*Noctua*), 92
 xanthographa (*Noctua*), 33
 xanthomista (*Polia*), 141
 xanthovittana (*Peronea*), 14, 37, 64
 xenoclea (*Heliconius*), 151
 xerampelina (*Cirrhœdia*), 103, 115, 143
 xylosteania (*Tortrix*), 133
 xylostella (*Harpiteryx*), 247
 ypsilon (*Agrotis*), 32
 zatima (*Spilosoma*), 10
 zephyrus (*Plebeius*), 49

Order XIX. COLEOPTERA.

- abietis (*Hylobius*), 246
 *aciculatus (*Rhabdopterus*), 236
 *ænea (*Alethaxius*), 215
 ænea (*Colaspis*), 25
 ænea (*Hermesia*), 193
 *æneicollis (*Colaspis*), 171
 *æneus (*Colaspis*), 192
 æruginea (*Colaspis*), 25
 ærugineus (*Corymbites*), 73
 Agbalus, 25, 194
 alneti (*P.*), 55
 amazona (*Colaspis*), 73
 angulicollis (*Alethaxius*), 191
 *angulicollis (*Rhabdopterus*), 235
 annulata (*Coccinella*), 271
 apicicornis (*Rhabdopterus*), 235
 aquaticus (*Helophorus*), 174
 arietis (*Clytus*), 88
 armata (*Strangalia*), 54
 ater (*Sibotes*), 25
 aurata (*Colaspis*), 192
 aureolus (*A.*), 55
 aureopunctata (*Colaspis*), 25
 balteatus (*Elater*), 188
 banksi (*Chrysomela*), 272
 *basipenne (*Colaspis*), 73
 *bidenticollis (*Colaspis*), 191
 bifasciatum (*Rhagium*), 88
 bipunctata (*Coccinella*), 200, 271
 bisculata (*Coccinella*), 271
 *blatchleyi (*Rhabdopterus*), 216, 234
 *bolivianus (*Colaspis*), 170
 brunnea (*Hermesia*), 194
 *brunneipennis (*Colaspis*), 74
 caliginosus (*Epipolæus*), 300
 Campylochira, 25

- *carinipennis* (Alethaxius), 214
castanea (Colaspis), 25
cervus (Lucanus), 71
chalcites (Colaspis), 27, 74
chiriquensis (Agbalus), 214
chrysis (Colaspis), 25, 28
cinctella (Colaspis), 73
**cinctipennis* (Colaspis), 75
Colaspis, 25
**concolor* (Colaspis), 28
**confusa* (Hermesia), 194
confusus (Colaspis), 26
coriarius (Prionus), 88
coryli (A.), 55
coryli (O.), 55
cribricollis (Colaspis), 26
cruentate (Colaspis), 28
cupreus (Corymbites), 104
cuprinus (Rhabdopterus), 254
curculionoides (A.), 55
**cyanea* (Hermesia), 193
cylindricum (Sinodendron), 200
**denticollis* (Colaspis), 191
**dilatipes* (Agbalus), 195
**dilatipes* (Colaspis), 26, 29, 72
**dispar* (Colaspis), 73
dispar (Xyleborus), 152
distortus (Rhabdopterus), 255
domesticus (Xylotenus), 104
Donacia, 22
dorsalis (Anchomenus), 150
**12-notate* (Colaspis), 75
12-punctata (Crioceris), 200
elongatus (Elater), 88
Eriphylina, 25
erosulus (Rhabdopterus), 193
erosus (Ips), 299
fastuosa (Cassida), 247
ferruginea (Colaspis), 25
**flavofasciata* (Colaspis), 28
formicarius (Thanasimus), 89
foveolata (Colaspis), 191
fulva (Colaspis), 25
fulvibarbis (Leistus), 104
fulvicornis (Campylochira), 25
**fuscipes* (Colaspis), 190
fuscitarsis (Colaspis), 25
geminata (Colaspis), 25, 26, 27, 30, 72
gemmingeri (Colaspis), 26
Geotrupes, 199
germanicus (Henoticus), 102
glandium (B.), 55
**goyazensis* (Colaspis), 26, 29
graminis (Chrysomela), 272
granaria (Calandra), 200
**grenadensis* (Rhabdopterus), 216, 234
haroldi (Colaspis), 25
harpuloides (Ocys), 104
hemispherica (Cassida), 102
Hermesia, 192
hieroglyphica (Coccinella), 22
hirtus (Emus), 174
humeralis (Colaspis), 25, 195
**ignotus* (Rhabdopterus), 254
**impressipennis* (Colaspis), 171
inequalis (Coccinella), 271
inconspicua (Colaspis), 26
inconstans (Colaspis), 170
indigator (Rhagium), 88
**inermis* (Hermesia), 194
inquisitor (Calasoma), 71
inquisitor (Rhagium), 22, 88
interrupta (Colaspis), 25
interruptus (Necrophorus), 102, 247
interstitialis (Colaspis), 25, 92
**jacobyi* (Hermesia), 193
**jocosa* (Colaspis), 171
**klagii* (Colaspis), 26, 72
levigata (Timarcha), 22, 200
lateralis (Colaspis), 25
lebasii (Colaspis), 28
**lebasoides* (Colaspis), 25, 27
lefevrei (Colaspis), 25, 72
lusitanica (Lampyrus), 200
lythropterus (Elater), 88
manca (Colaspis), 170
melancholica (Colaspis), 74
melanura (N.), 55
mexicana (Colaspis), 28
moschata (Aromia), 247
mucronatus (Blaps), 104, 175
murinus (Ortholestes), 104
musæorum (Anthrenus), 104
mysticus (Clytus), 88
nebulosa (Cassida), 299
nebulosus (Leiopus), 88
nigrimana (Colaspis), 25
nigrocyanæa (Colaspis), 74
nitens (Carabus), 22
noctiluca (Lampyrus), 88
obliqua (Colaspis), 190
oculata (Mylabris), 300
oregonensis (Colaspis), 25
ornatipennis (Colaspis), 75
**otileensis* (Colaspis), 73
**pallida* (Alethaxius), 215
pantherina (Coccinella), 271
pectinicornis (Corymbites), 104
peletieri (Graphipterus), 149
pennsylvanicus (Photuris), 199, 200
perplexa (Colaspis), 26
peruensis (Rhabdopterus), 254
**peruvianus* (Colaspis), 74
piceipes (Rhabdopterus), 216, 234
picipes (O.), 55
plagiatus (Agbalus), 195
polita (C.), 55
prætaxta (Rhabdopterus), 216
prasina (Colaspis), 27
proscarabæus (Meloë), 272
pruinosa (Colaspis), 72
pubescens (Staphylinus), 104
punctatissima (Rhabdopterus), 254
puncticollis (Agbalus), 194
puncticollis (C.), 25
**punctipennis* (Colaspis), 26, 72
pusilla (Colaspis), 191
pyrenæus (Geotrupes), 88

quadripunctata (Silpha), 71
 *4-foveata (Colaspis), 74
 4-maculata (Coccinella), 271
 Rhabdopterus, 216
 *rosenbergi (Rhabdopterus), 255
 rotundatus (Graphipterus), 149
 rugosa (Colaspis), 25
 rustica (Colaspis), 25
 salicis (Orchestes), 200
 sanguinolentus (Elater), 54, 88
 saxeseni (Xyleborus), 152
 scalaris (Saperda), 90
 semifulvus (Rhabdopterus), 235
 sericea (Donacia), 103
 sericeus (Agbalus), 194
 sexpustulata (Coccinella), 271
 *similis (Hermesia), 193
 *similis (Rhabdopterus), 235
 subænea (Colaspis), 72
 submetallica (Colaspis), 72
 *sulcipennis (Rhabdopterus), 253
 Talurus, 25
 tarsata (Colaspis), 73
 tarsata (Rhabdopterus), 236

tenebricosus (O.), 55
 tenebrosus (Agbalus), 194
 tessellatus (B.), 55
 thoracica (Silpha), 71
 touquii (Cicindela), 149
 *townsendi (Colaspis), 25, 27
 tricolor (Mylabris), 300
 trivialis (Colaspis), 25, 26, 29, 72, 170
 tucumanensis (Colaspis), 169
 umbellatarum (Necydalis), 88
 unicolor (Callidium), 199
 unicolor (Colaspis), 25
 unifasciata (Coccinella), 271
 variabile (Callideum), 88
 verrucosus (Alethaxius), 25
 vesbillo (Neerophorus), 71
 viminalis (Phytodecta), 222
 violaceum (Callideum), 88
 violaceus (Rhabdopterus), 192
 *viridicollis (Colaspis), 170
 *viridis (Agbalus), 214
 viridissima (Colaspis), 25
 vulgata (Colaspoides), 25

Order XXI. DIPTERA.

affinis (Gonomyia), 111
 alaskaensis (Theobaldia), 39
 americana (Adelphomyia), 84
 annulata (Theobaldia), 39, 150
 arctica (Theobaldia), 39
 Atarba, 81
 atricapillus (Dioctria), 71
 atricapillus (Machimus), 71
 autumnalis (Musca), 149
 autumnalis (Tabanus), 71
 bicinctum (Chrysotoxum), 71
 bifurcatus (Anopheles), 23, 176
 borealis (Sericomomyia), 71
 bovinus (Tabanus), 70, 71
 bromius (Tabanus), 71
 buccata (Myopa), 71
 cæcutiens (Chrysops), 71
 campestris (Rhingia), 71
 casei (Pyophila), 22
 cayuga (Adelphomyia), 84
 ceriiformis (Conops), 71
 ceylonica (Styrgomyia), 112
 Chrysops, 70
 circumdatus (Anthrax), 71
 cladoptera (Macromastix), 81, 111
 cornicina (Pseudopyrellia), 46
 corni (Oligotrophus), 247
 crabroniformis (Asilus), 71
 crassicornis (Hæmatopota), 71
 cuprea (Chrysochlamys), 71
 cyanurus (Nevitamus), 71
 *cyclopila (Limnophila), 83, 109
 Diceranomyia, 81
 disjunctula (Adelphomyia), 83
 distinguendo (Theriopectes), 71
 Dolichocheza, 111

domestica (Musca), 224
 Empeda, 81
 Epiphragma, 81
 equina (Hippobosca), 71
 Euprosopia, 31
 *excavata (Diceranomyia), 83, 110
 *extensa (Styrgomyia), 83, 112
 falciparum (P.), 128
 fasciata (Stegomyia), 23, 223
 ferox (Echinomyia), 71
 ferrugineus (Sicus), 71
 festivum (Chrysotoxum), 71
 florea (Xylota), 71
 *foordi (Scholastes), 30
 fraxini (Perissa), 200
 fulvus (Atylotus), 71
 fusca (Glossina), 175
 geniculatus (Ochlerotatus), 176
 gigantea (Tipula), 71
 globulus (Acrocephalus), 71
 Gonomyia, 81
 grossa (Echinomyia), 70, 71, 117
 Gymnaster, 81
 hemiptera (Allophora), 71
 Holurusia, 33
 *hooleyi (Tipula), 82
 *indecisa (Gonomyia), 83, 111
 inferior (Musca), 128
 irrorata (Limnophila), 110
 lenta (Xylota), 71
 limiformis (Tipula), 82
 Limnobia, 81
 Limnophila, 81
 lutea (Limnophila), 110
 lutescens (Tipula), 82
 Macromastix, 81

maculicornis (Tabanus), 70, 71
major (Bombylius), 71
marginata (Laphria), 71
Megistocera, 81
Microdon, 45
Mongoma, 81
novæangliæ (Limnophila), 110
pellucens (Volucella), 54
Phlebotomus, 176, 224
pipiens (Culex), 176
plumbeus (Anopheles), 23, 128, 176
pluvialis (Hæmatopota), 71
potamida (Stratiomys), 71
pubipennis (Dicranomyia), 110
pudica (Dicranomyia), 111
pulchripalpis (Orthopodomyia), 80
punctatum (Miltogramma), 71
quadrata (Chrysops), 71
quadrifasciata (Conops), 71
Rhipidia, 81
rivosa (Pedicia), 71

rufipes (Physocephala), 71
Scholastes, 31
schwetzi (Glossina), 176
siberiensis (Theobaldia), 39
solstitialis (Theriopectes), 71
sparsa (Chilosa), 71
Stratiomys, 22
Styringomyia, 81
sylvarum (Xylota), 71
Syrphus, 22, 71
Tabanus, 70
tesellata (Empis), 71
Theobaldia, 39
Tipula, 81
tropicus (Theriopecta), 70, 71
**undulata* (Dicranomyia), 83, 110
**vasifera* (Holorusia), 82
vernalis (Tipula), 82
vicarius (Scholastes), 30
Xylota, 71

Order XXII. HYMENOPTERA.

afzeliella (Andrena), 47
agrorum (Bombus), 70
albicans (Andrena), 47
albiditarsis (Meteorus), 199
albilabris (Crabro), 46
albipes (Halictus), 47
alternata (Nomada), 47
americanus (Apanteles), 199
Andrena, 47
arenaria (Cerceris), 46
argentata (Andrena), 47
armata (Melecta), 70
arvensis (Mellinus), 46
atalantæ (Theronia), 148
aterrima (Stellis), 78
barbutellus (Psithyrus), 70
bicolor (Mimesa), 46
bicolor (Pompilius), 77
bimaculata (Sarapoda), 70
Bombus, 19, 70
boops (Astatus), 45
calcaratus (Panurgus), 47
callosus (Odynerus), 47
campestris (Ammophila), 45
centuncularis (Megachile), 48
cephalotes (Crabro), 46
chrysostomus (Crabro), 46
circumcincta (Megachile), 47
coartata (Eumenes), 47
crabro (Vespa), 46, 118, 221
crassicornis (Odynerus), 47
cribrarius (Crabro), 46
cylindricus (Halictus), 47
daviesana (Colletes), 47
derhamellus (Bombus), 70
dimidiatus (Crabro), 46
ducalis (Stephanus), 257
elongata (Cœloxys), 47
europæa (Mutilla), 22, 45

exaltata (Salix), 45
flavius (Lasius), 247
floreæ (Andrena), 47
fodiens (Colletes), 47
fuliginosus (Acanthomyops), 149
fuliginosus (Lasius), 45
fulvius (Andrena), 47
furva (Nomada), 47
fuscipes (Andrena), 47
fuscus (Salix), 45
gallicus (Polistes), 247
germanica (Vespa), 47, 54, 221, 272
gibbus (Pompilus), 45
gibbus (Sphecodes), 47
gigas (Sirex), 53, 199
gracilis (Odynerus), 47
hirsuta (Psammophila), 46
hortorum (Bombus), 70
interruptus (Cerceris), 46
ischnus (Orgilus), 8
jacobææ (Nomada), 47
jonellus (Bombus), 70
juvencus (Sirex), 53
labiata (Cerceris), 46
lapidarius (Bombus), 70
lapponicus (Bombus), 300
lathburiana (Nomada), 47
laticinctus (Hoplisis), 46
leucomelana (Osmia), 70
lignisea (Megachile), 48
lituratus (Crabro), 46
lugubris (Pemphredon), 46
lutaria (Psammophila), 46
maculata (Cerophales), 45
manicatum (Anthidium), 70, 78, 271
melanocephalus (Odynerus), 47
Melecta, 70
mellifera (Apis), 30
mellifica (Apis), 30

- minutissimus (*Halictus*), 47
 minutula (*Andrena*), 47
 minutulus (*Pompilus*), 77
Mutilla, 22
 mystaceus (*Gorytes*), 46
 niger (*Pompilus*), 45
 nigro-æneus (*Horismenus*), 199
 nitidusculus (*Halictus*), 47
 norvegica (*Vespa*), 47
 obscurator (*Orgilus*), 7
Odynerus, 47
Orgilus, 7
 ornata (*Cerceris*), 46
Osmia, 70
 ovata (*Eriocampa*), 272
 palmata (*Tenthredopsis*), 222
 parietina (*Osmia*), 70
 parietinus (*Odynerus*), 47
 parietum (*Odynerus*), 47
 parvulus (*Salix*), 45
 pectinipes (*Pompilus*), 45
 pectinipes (*Tachytes*), 45
 peltarius (*Crabro*), 46
 persuasoria (*Rhyssa*), 199
 pictus (*Odynerus*), 47
 pilipes (*Anthophora*), 70, 222
 *pilosus (*Stephanus*), 256
 plumbeus (*Pompilus*), 45
 prasinus (*Halictus*), 47
 pratorum (*Bombus*), 70
Psithyrus, 70
 quadrimaculata (*Anthophora*), 70
 quadrimaculata (*Crabro*), 46
 quadrinotus (*Halictus*), 47
 regius (*Torymus*), 117
 retusa (*Anthophora*), 70
 roberjeotiana (*Nomada*), 47
 rosæ (*Andrena*), 150
 rubicundus (*Halictus*), 47
 rufa (*Epeolus*), 47
 rufa (*Formica*), 45, 233
 rufa (*Vespa*), 47
 rufescens (*Cœloxys*), 47
 rufipes (*Mutilla*), 45
 *rugosus (*Stephanus*), 256
 rugiceps (*Fænotopus*), 258
 rugulosus (*Microdus*), 6
 rupestris (*Psithyrus*), 70
 sabulosa (*Ammophila*), 45
 sabulosus (*Mellinus*), 46
Sceliphron, 199
 sexfasciata (*Nomada*), 47
 sinuatus (*Odynerus*), 47
 solidaginis (*Nomada*), 47
 spinipes (*Odynerus*), 47
 spissus (*Pompilus*), 77
 subquadratus (*Sphecodes*), 47
 succincta (*Nomada*), 78
 succinctus (*Colletes*), 47
 sylvarum (*Bombus*), 70
 sylvestris (*Vespa*), 47
 terrestris (*Bombus*), 70
 thoracica (*Andrena*), 47
 trifasciata (*Odynerus*), 47
 trimerana (*Andrena*), 150
 tristis (*Diodontus*), 46
Trypoxylon, 45
 tuberculatus (*Earinus*), 6
 tumidulus (*Microdus*), 7
 umbratus (*Acanthomyops*), 149
 unicolor (*Apis*), 31
 unicolor (*Stephanus*), 257
 uniglumis (*Oxybeles*), 46
 *variidens (*Fænatopus*), 259
 venustus (*Bombus*), 70
Vespa, 53
 vestalis (*Psithyrus*), 70
 viaticus (*Pompilus*), 45
 villosulus (*Halictus*), 47
 villosus (*Stephanus*), 256
 vulgaris (*Vespa*), 47
 wæsmali (*Pompilus*), 45
 willughbiella (*Megachile*), 48
 xanthopus (*Halictus*), 47

Vol. LIV.]

JANUARY, 1921.]

No. 693.

III

ENTOMOLOGIST

AND

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c. DR. D. SHARPE, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHEDDEN, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST-NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also
Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION
36, Strand, London, W.C. 2.

BEXLEY, L. W. NEWMAN, F.E.S., KENT.

Finest Stock of **Set Insects, Ova, Larvæ and Pupæ**
of **British Macro-Lepidoptera** in the Kingdom.

Price Lists on application.

30,000 **British Micro-Lepidoptera**, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 **British Coleoptera**, 2500 species. 300 vols. **Entomological Books and Magazines.**

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

FOR SALE. An extensive stock of **Lepidoptera**, including rare and local forms. On sale at the lowest prices consistent with high quality. Common species (assorted) 1 = doz. All sent on approval. Send for lists.

A. J. SPILLER, CHINNOR, WALLINGFORD

THE ENTOMOLOGIST.

VOL. LIV.]

JANUARY, 1921.

[No. 692

THE ENTOMOLOGICAL SOCIETY OF LONDON.

AN ANNOUNCEMENT AND AN APPEAL.

THE New Year inaugurates an epoch in the annals of the Entomological Society of London, the oldest continuous-lived Society devoted to entomology in the world except the sister Society of France, which pre-dates it by a year only, having been founded in 1833. In 1921, in February or March, our Society will hold its first meeting in premises of its own at 41, Queen's Gate, close to the Natural History Museum, and the long connection with the rooms of the Medical Society in Chandos Street, Cavendish Square, comes to an end. These rooms the Society has occupied for its meetings and for its library since November 3rd, 1875. Prior to that date the meetings had been held for some considerable time in the rooms of the Linnean Society at Burlington House, the library being accommodated in Bedford Row—an extremely inconvenient arrangement, as the then President, Sir Sidney Smith Saunders, C.M.G., pointed out when congratulating the members of the Society upon the change of venue. Already the library had become too large for the space allotted, while the facilities offered those using it were hopelessly inadequate. In this respect history repeats itself. The library has far outgrown the shelves at disposal in Chandos Street, while so great has been the increase of Fellowship that the meeting-room of late years, and even during the war period, has been insufficient to seat the augmented number of those attending. But hitherto, as stated, the Society has been no more than a tenant at will of the Medical Society, as previously of the Linnean. It will now be master in its own house, and a very fine house into the bargain. The occupation of the Chandos Street premises, moreover, has witnessed other and remarkable changes alike in the constitution of the Society and the bye-laws governing its activities. In 1885 the President, Mr. J. W. Dunning, a benefactor in many ways, appealed for the incorporation of the Society, and in July of that year a Charter was granted by warrant under the Queen's Sign Manual, and in 1913 His Majesty King George became patron. Meanwhile, from the beginning of the present century, the war notwithstanding, the roll of Fellows has steadily enlarged, until it is

clear that the Society may claim to be known not merely by its time-honoured title of the Society of London, but, should it be desired, by the title of the Society of the United Kingdom. Looking through the current list, the number of overseas Fellows elected in recent years, and drawn from the Commonwealths, Dominions, and Empire of India, is proof conclusive of the extended interest in entomology inspired and fostered by those who have given unremitting and unstinted service to this now acknowledged important branch of science. It is agreeable, therefore, to know that the Society's first sub-tenant occupying a set of rooms is the Imperial Bureau of Economic Entomology—a body supported alike by what we still call the "Colonial" Office in Whitehall and by every overseas Government within the British Empire, which happy conjunction is further emphasised by the co-operation of the College of Science, many of whose members are showing their interest in the Society in the best possible way by becoming Fellows. The acquisition of a spacious home, again, assures a central meeting-place for entomologists from all parts of the world.

A circular letter now issued by the retiring President, Commander J. J. Walker, R.N., sets out in detail particulars of the accommodation available, and it is a source of genuine pleasure to know that the magnificent library, hitherto subject in great part to all the elements of deterioration implied in congested shelves or no shelves at all, dirt and darkness, will be properly cared for and protected. The fabric itself is in good condition, and the sum, estimated at £10,000, to purchase the property and complete the necessary decorations and other alterations will not be exceeded. In the preliminary circular, issued in June, it was announced that funds would be raised by donations and by the creation of debentures at 5 per cent., secured on the property. A considerable response has already been made to the original appeal, but much remains to be done, despite the generous and satisfactory scale upon which contributions have been made. I venture, therefore, to bring to the notice of all readers of the 'Entomologist,' whether Fellows of the Society or (as I hope) intending Fellows of the Society, the financial needs of the moment. The purchase money has been subscribed, but, of course, there is still a large sum required to cover the cost of repairs to and upkeep of the building, the removal of the library and the new fittings thereof, and the furnishing of all such rooms and offices necessary to their comfort and convenience. If every Fellow helps according to his means—and there are many Fellows who will, I am sure, respond when they are in possession of the facts, either by gift or by purchase of debenture bonds—then the complete success of the venture is assured, and, further, an example afforded other Societies in less fortunate circumstances of housing, that the

enterprise of the individual is in every way superior, whether in science or in commerce, to reliance on State aid only. *Bis dat qui cito dat*: and entomologists of all branches will have reason to congratulate themselves if and when the Entomological Society of London enters upon what may be called the third epoch of its existence free of debt and financial anxiety. The increase of the annual subscription will not help the fabric fund. It will do little more, under existing conditions, than allow the Treasurer to meet satisfactorily the inflated cost of printing and publishing the Society's invaluable transactions and proceedings.

H. ROWLAND-BROWN.

Harrow Weald;
December 11th, 1920.

THE HETEROPTERA OF INDO-CHINA.

By W. L. DISTANT.

Family PENTATOMIDÆ.

Sub-Family PENTATOMINÆ.

THE present contribution to a knowledge of the Heteroptera of Indo-China is in continuation of other papers on the same subject which have already appeared in the 'Entomologist.' I am still indebted to Mon. R. Vitalis de Salvaza for the material, which I have placed in the collection of the British Museum as hitherto.

LIST OF SPECIES ALREADY RECEIVED.

DIV. HALYARIA.

- Dalpada oculata*, Fabr.
 „ *varia*, Dall.
 „ *smaragdina*, Walk.
 „ *perelegens*, Bredd.?
 „ *laosana*, sp. n.
 „ *viridissima*, gen. and
 sp. n.
Erthesina fullo, Thunb.
Halys rugosus, sp. n.
Agæus tessellatus, Dall.
 „ *mimus*, Dist.
 „ *tonkinensis*, sp. n.

DIV. DORPIARIA.

- Laprius nigritus*, sp. n.

DIV. AMYNTARIA.

- Halyabbas unicolor*, Dist.
Amyntor obscurus, Dall.

DIV. CARPOCORARIA.

- Niphe subferruginea*, Westw.
 „ *vittativentris*, Stål.
Neoniphe armata, sp. n.
Halyomorpha picus, Fabr.
 „ *fletcheri*, Dist.
Tolumnia latipes, Dall., var.
 „ *basalis*, Dall.

DIV. EUSARCOCORIARIA.

- Eusarcocoris guttiger*, Thunb.
 „ *rosaceus*, Dist.
Carbula crassiventris, Dall.
 „ *scutellata*, Dist.

DIV. HOPLISTODERA.

- Alcimocoris coronatus*, Stål.
Hoplistodera tonkinensis, sp. n.
 „ *scutello-maculata*,
 sp. n.
Sacotala rugulosa, gen. and sp. n.

Div. ANTESTARIA.

Plautia fimbriata, Fabr.*Antestia anchora*, Thunb.*Anaca florens*, Walk.*Antestia pulchra*, Dall.,, *modificata*, Dist.

Div. EURYDEMARIA.

Agonoscelis nubila, Fabr.,, *femoralis*, Walk.*Eurydema pulchrum*, Westw.*Stenozygum speciosum*, Dall.*Strachia crucigera*, Hahn.

Div. COMPASTARIA.

Critheus lineatifrons, Stål.*Agathocles dubius*, sp. n.*Exithemus mansonicus*, Bredd.?

Div. TROPICORARIA.

Prionaca tonkinensis, sp. n.,, *lata*, Dall.*Placosternum taurus*, Fabr.

Div. RHYNCHOCORARIA.

Rhynchocoris humeralis, Thunb.*Epagathus chapana*, gen. and
sp. n.

Div. NEZARIA.

Neojurtina typica, gen. and
sp. n.*Catacanthus incarnatus*, Dru.*Nezara viridula*, Linn.

Div. MENIDARIA.

Menida laosana, sp. n.,, *raja*, sp. n.,, *vitalisana*, sp. n.,, *salvazana*, sp. n.*Udonga spiridens*, gen. and
sp. n.*Paterculus aberrans*, sp. n.,, *affinis*, Dist.*Dalpada laosana*, sp. n.

Head, pronotum and scutellum ochraceous, thickly, coarsely, blackly punctate, apical third of scutellum pale ochraceous, the punctures concolorous; membrane bronzy-black; antennæ black, bases of fourth and fifth joints creamy-white; body beneath and legs ochraceous, lateral margins of head and pronotum (broadly), sublateral marginal fasciæ to abdomen—meeting margins at junction of segments—two large spots between pro- and meso-coxæ, two large spots on second abdominal segment, and a central spot on penultimate segment, shining black; rostrum just passing the first abdominal segment.

Long, 19 mm.; breadth between pronotal angles, 10 mm.

Laos, Luang Prabang.

OUSCHA, gen. nov.

Body elongately ovate; head considerably longer than broad, the lateral lobes longer than the central lobe and slightly upturned and divergent, a strong spinous angulation on each lateral margin before the insertion of the antennæ and a smaller spine on each side before eyes; antennæ 5-jointed, basal joint not reaching apex of head, second and third about subequal in length and shorter than fourth and fifth, eyes globose and prominent; rostrum about passing the bases of the posterior coxæ; lateral margins of the pronotum crenulated, the lateral angles shortly, robustly prominent; membrane with about six prominent longitudinal veins; tibiæ furrowed beneath on apical areas, the anterior tibiæ somewhat broadened near apices, where they are sulcated beneath.

Allied to *Apodiphus*.

Ouscha viridissima, sp. n.

Above metallic-green, coarsely, thickly punctate, narrow anterior and lateral margins to head, eyes, lateral margins and apices of lateral angles to pronotum, body beneath and legs ochraceous; head, pronotum and scutellum thickly, coarsely punctate, corium more thickly and finely punctate; antennæ ochraceous, apex of third and about apical halves of fourth and fifth joints black; head apically broadly excavate between the lateral lobes; legs ochraceous, femora finely sprinkled with minute darker spots, lateral margins of the body beneath more or less suffused with metallic green; membrane pale brownish, slightly passing the abdominal apex.

Long, 17 to 18½ mm.; breadth between pronotal angles, 7½ mm.
Tonkin; Chapa. Laos; Xieng Khonang.

Halys rugosus, sp. n.

Body above thickly and very coarsely punctate, pale ochraceous, the punctures black or dark ochraceous; head elongate, tapering in front, the central lobe longer than the lateral lobes, blackly punctate, especially on central lobe and near eyes; antennæ ochraceous, the first, fourth and fifth joints darker, sometimes almost black, second joint a little shorter than third, fourth or fifth joints; eyes fuliginous; pronotum coarsely punctate, the lateral margins shortly dentate, the lateral angles shortly and broadly prominent and their apices broadly, distinctly upturned; scutellum coarsely blackly punctate, the lateral angle and apical area distinctly paler but coarsely punctate; corium blackly punctate, the punctures coalescing on disc and forming three irregularly-shaped spots; membrane dark bronzy-brown; body beneath and legs ochraceous; punctures to femora, basal and apical areas of tibiæ and apices of tarsi black; head beneath thickly, darkly, coarsely punctate, sternum laterally broadly, thickly darkly punctate, mesosternum with two contiguous, central, shining black spots, abdomen with the segmental margins and a subapical spot black, the lateral margins black with large ochraceous segmental spots; abdomen centrally longitudinally sulcate, rostrum reaching the third abdominal segment.

Long, 16–18 mm.; breadth between pronotal angles, 8½–9 mm.
Laos, Xieng Khonang, Giranville; Haut Mekong, Vieng Vai.

Agæus tonkinensis, sp. n.

Above ochraceous; head with a broad longitudinal black fascia broadened from between eyes and containing a central longitudinal ochraceous line; pronotum with two transverse elongate spots behind anterior margin, two large rounded central spots on disc which nearly reach posterior margin, and two small oblique submarginal spots situate just above lateral angles, black; scutellum with the basal area dark greenish-black, beyond which the sublateral margins are of the same colour; corium with a broad central transverse fascia and a rounded spot both near base and apex, black; membrane bronzy-black; body beneath ochraceous with bluish-black maculations both centrally and laterally; rostrum bluish-black,

ochraceous at base and extending to third abdominal segment; antennæ black, first joint slightly passing apex of head, second, third and fourth joints longest and almost subequal in length; body above thickly and somewhat coarsely punctate.

Long, 19 mm.

Tonkin; Chapa.

Laprius nigrilus, sp. n.

Head black, ocelli red, eyes brownish-ochraceous; pronotum and scutellum dark castaneous, almost black; corium a little paler and more castaneous; membrane dark greyish; body beneath and legs black; rostrum very dark castaneous, basal joint ochraceous; antennæ mutilated in type, but first and second joints dark ochraceous, basal joint annulated with black near apex, first joint not reaching apex of head; head, pronotum and scutellum thickly, very coarsely punctate, corium thickly but more finely punctate; body beneath thickly, very finely punctate; rostrum very slightly passing the posterior coxæ; antenniferous tubercles with a small spine at base.

Long, 11 mm.; breadth between pronotal angles, $5\frac{1}{2}$ mm.

Laos; Xieng Khoyang.

(To be continued.)

CONTRIBUTIONS TO OUR KNOWLEDGE OF THE BRITISH BRACONIDÆ.

BY G. T. LYLE, F.E.S.

(Continued from vol. liii, p. 250.)

Described from two males and two females in the Dale Collection at Oxford and a pair in the Cambridge University Museum. Considering these are all old pinned specimens they are in fairly good condition though all are more or less damaged. The Cambridge specimens and two of those at Oxford are without data; the remaining Oxford examples bear locality labels, but Dale's writing thereon is almost indecipherable; one has the date 1899 with some hieroglyphs and the other appears to read "ex *Polycommata*." All Dale's specimens were named by him *Microdus rugulosus*, Nees; that species, however, has a length of only $3\frac{1}{2}$ mm. and the terebra as long as abdomen and thorax, besides differing in other respects.

Earinus tuberculatus, Wesm.*

Very similar to *delusor*, but differing in that the radius has a double curve and the tubercles of the first abdominal segment are very prominent, etc. Wesmael's description is as follows:

"Niger, pedibus rufis, coxis, trochanterum articulo primo,

* 'Nouv. Mem. Acad. Sc. Belg.,' vol. x, p. 13.

tarsisque posticis nigris; tibiis posticis albidis, macula ante basin apicique fuscis; primi segmenti abdominis tuberculis lateralibus acute prominulis (coxis posterioribus rufis; terebra corpore paulo brevior, ♀).

The terebra is very slightly shorter than abdomen and thorax combined; the hind coxæ are rufous in the female but black in the male; wings hyaline at base, darker towards apex. Antennæ 30-31-jointed. In some examples the nervure dividing the first cubital and first discoidal cells, though always traceable, is indistinct, which adds to the structural resemblance the species bears to *Microdus tumidulus*; there can be no doubt, however, that it is a true *Earinus*, the mesothoracic sutures being almost indiscernible.

Not before recorded as British and possibly hitherto confused with *delusor* (*gloricatorius*, Marsh). I have found it fairly common in the New Forest, where on dull, damp days in April and early May I have on many occasions beaten both sexes from the leafless, lichen-covered branches of oak trees.

GENUS 5. *Orgilus*, Hal.*

Authors have taken somewhat divergent views as to the true position of this aberrant genus, and although the majority consider it rightly placed with the *Agathidæ*, there is no doubt that considerable affinity is shown to the *Macrocentridæ*, as noted by Haliday, and also to the genera *Eubadizon* and *Pygostolus*. I am rather inclined to agree with Ashmead,⁺ who based his *Orgilini*, a tribe of his *Blacinae*, on the genus, placing it immediately before *Eubadizon*. Szépligiti† did not agree with the American classification and restored the genus to its old position.

Maxillary palpi 6-, labial 4-jointed. Face ordinary; mesopleuræ with a crenulate furrow; mesothorax distinctly trilobed. Wings short, narrow, stigma somewhat elongate, two cubital cells, the first distinct from the first discoidal; radial cell narrow, though much larger than in the preceding genera, ending much before apex of wing; first intercubital nervure almost in a line with the second (third) abscissa of radius.

TABLE OF SPECIES.

Wings normal; terebra as long as body . . . *obscurator*, Nees.
Wings narrow; terebra rather longer than abdomen . . . *ischnus*, Marsh.

Orgilus obscurator, Nees.§

A robust black insect with infumated wings and the legs

* 'Ent. Mag.,' vol. iii, p. 123.

† 'Proc. U.S. Nat. Mus.,' vol. xxiii, p. 122.

‡ 'Gen. Ins. (Braconidæ),' p. 119.

§ 'Mon.,' vol. i, p. 151.

more or less rufescent; and occasionally the second abdominal segment rufous at the sides. Terebra as long as the body. Varies very considerably in size; I have seen males with a length of 5 mm. and others no more than 3 mm.

Seven females and one male, all without data, are in Dale's Collection, and one male and three females in the Hope Museum Collection. Cambridge University Museum possesses a single female taken by C. G. Lamb at St. Merryn, June, 1916. Harwood has a fine pair, the male bred from a Colchester larva of *Retinia buoliana*, July 8th, 1914, and the female from the same host at Wivenhoe, August, 1910. I have taken it at the Fleam Dyke, Cambridge, and also in the New Forest in August.

Orgilus ischnus, Marsh.¶

Described by Marshall from specimens taken by Bridgman. One labelled "type" is in the British Museum. In this example the abdomen is longer and wings smaller and narrower than in *obscurator*. Antennæ 32-jointed in both sexes; terebra rather longer than abdomen.

I have never met with the species myself, nor is it represented in any of the collections to which I have had access with the exception of the single specimen mentioned above.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from vol. liii, p. 259.)

LYMANTRIIDAE.

Lælia cænosa.—Series of 35 from various collections. One female from the Meldola is labelled "Burwell Fen. Dr. W. Horley."

Oneria dispar.—A long series from the Hope and Spilsbury and more modern collections, some of them apparently of great age. Three males from the Spilsbury Collection have the inner and central portions of the fore wing nearly filled with whitish, with a dark narrow band along the outer margin. A small, seemingly very old male has all the wings of a dingy white.

Lymantria monacha.—A series of 6, bred by Mr. C. Rippon from New Forest parents, have the abdomen banded with pale yellow instead of the normal pink. The fore wings are suffused with black to an abnormal extent.

¶ 'Spec. Hym. Eur.,' vol. v bis, p. 197.

LASIOCAMPIDÆ.

Pachygastria trifolii.—Two specimens from the Hope Collection came from F. Bond's Collection. They were bred in August, 1871, from larvæ taken in Romney Marsh, Kent. They are described in the 'Proceedings of the Entomological Society,' November 20th, 1871. They are very pale brown on the inner portion of the fore wings, the outer portion being ochreous.

Lasiocampa quercus.—A very remarkable specimen from the Hope Collection, which has the body and wings of a female with male antennæ, also came from F. Bond. It is labelled "May, 1867, larva found in the London District." On another label is "Mr. F. Bond."

Macrothylacia rubi.—In a male specimen from the Hope Collection the two pale lines are widened and drawn close together, making a pale band, only showing indications of the dark inner band at the costa and inner margin. In two other specimens taken by myself in North Staffs by assembling, and in one from the Meldola Collection from Morpeth, the two pale lines are much nearer to each other than is normal. In two others, one bred by myself from a New Forest larva, the other from the Chitty Collection, also from the New Forest, the inner pale line is obsolete.

Gastropacha ilicifolia.—Two specimens from the Spilsbury Collection without data. One from the Sellon Collection, labelled "Cannock Chase by Orgill of Rugeley." It is rather faded and the antennæ are wanting, but is otherwise in very fair condition.

DREPANIDÆ.

Drepana falcatoria.—Five ab. *pallida*, White.

D. harpagula = *sicula*.—Six specimens, four presented by Mr. G. C. Griffiths, bred by him from larvæ beaten in the Leigh Woods, Bristol, 1895, 1896 and 1899. One from the Meldola Collection, labelled "Leigh Woods, Bristol bred 6. 1899." One from the Sellon Collection, without data.

D. lacertinaria.—Several ab. *scincula*, one of them from the Hope Collection being a Haworth specimen and labelled by him "*scincula*."

NOLIDÆ.

Nola strigula.—Six from the Sellon Collection, New Forest; 5 from the Meldola Collection; 4 from Sussex, Abbot's Wood; 1 Kent, Darenth Wood; 1 from the Pogson Smith Collection, labelled "Oxford district, July 1897."

N. confusalis.—Two specimens of ab. *columbina*, Selwyn Image, from Epping Forest. One of them is one of the two specimens exhibited at a meeting of the Entomological Society, June

6th, 1906, and reported in the 'Proceedings of the Entomological Society' of the same date. The other is from the Meldola Collection, taken in Epping Forest, May 30th, 1908. This variety was first described in the 'Entomological Record,' vol. xvii, p. 188.

N. albulalis.—Long series, but only eight specimens with data. These are from the Meldola Collection, labelled "Kent. Chattenden," without date.

N. centonalis.—Eight specimens. One from the Meldola Collection, labelled "Deal. 1881/3. Rt. Adkin." One specimen in each series of *N. cuculatella*, *strigula* and *confusalis* are Haworth specimens, and each is labelled with its name in his writing.

N.B.—Haworth's specimens are recognisable by a special label.

SARROTHRIPINÆ.

Sarrothripa revayana.—Series of over 100, including almost every possible variation. By far the greater number are from the New Forest. By the kindness of Mr. South several of the forms have been identified and named.

ARCTIIDÆ.

Spilosoma menthastri.—In a long series from Perthshire, bred and presented by Mr. T. M. Marshall, the fore wings are of varying shades of pale buff. From the Meldola Collection is a very dark buff form from Glasgow. A female from North Staffs, bred by myself last year, is asymmetric, the right fore wing having less than half the number of spots that there are on the left. The right hind wing has only one very small submarginal spot, while the left has two. In both hind wings the central spot is obsolete. From the Hope Collection is one of Haworth's specimens, labelled by him *S. lubricipeda*. The series contains 14 ab. *radiata* and 9 ab. *zatima*.

Diaphora mendica.—Six specimens bred by Mr. L. W. Newman are six hybrids, between the type and ab. *rustica*. The males are pale greyish-buff. In a series of 16 bred from ova obtained by me from Mr. L. W. Newman in 1916, together with the two parents, the males, except one, which is rather pale buff, are of true *rustica* type. From two of this brood another generation of 17 specimens was reared. The male parent was of the true *rustica* type, but 3 of the male offspring resembled the hybrid males alluded to above, the 6 other males being true *rustica*.

Phragmatobia fuliginosa.—In 3 females from the Champion Collection, bred from larvæ taken near Woking, and a female from the Meldola Collection, taken in North Cornwall, the fore wings are dark and the hind wings show only a very narrow red border along the inner margin, and closely resemble var. *borealis*.

A series of 6 var. *borealis* from Aberdeenshire was presented by Mr. A. Horne.

Parasemia plantaginis.—In a striking series of 18, taken wild near Cerne Abbas, Dorset, by Dr. R. C. L. Perkin, and presented by him, the paler markings predominate over the black. This is particularly noticeable in the females, five of which have remarkably small proportion of black in the fore wings. A specimen from the Sellon Collection has a female body and markings, but the right antenna is female and the left male. It is labelled "Hermaphrodite (Harwood)."

Diacrisia sanio.—A male taken in N. Staffs by myself in 1917 is almost entirely wanting in the black border of the hind wings, this being slightly indicated by a few greyish scales. A female taken in the same locality has almost the whole of the hind wing filled with black, only two small rufous spots being left.

Arctia caia.—A long series showing a great deal of minor variation. There is one very remarkable aberration of a female from the Spilsbury Collection. Except for a few very small white spots which do not correspond with each other on each side the whole of the forewings are filled up with very dark brown. On this dark brown ground are black markings exactly corresponding with the usual white markings of a normal specimen. The hind wings have a very broad blue-black border, with a broad dark central band. From the Hope Collection is a female with normal markings, but with lemon-coloured hind wings.

Callimorpha dominula.—One from the Chitty Collection taken in S. Devon has the two spots near the anal angle of the hind wings coalescent, with much blackish suffusion towards the centre of the wing, resembling a smudged ink-blot. A series of 10 fine bred ab. *rossica* from Kentish stock (from L. W. Newman).

Coscinia striata.—Two specimens, both from the Hope Collection. One of them has a label "Wells Brit. Coll." Neither of them is in perfect condition.

C. cribrum.—Varied series of over 60, mostly from Ringwood. Six from the Meldola Collection, labelled "Canford, Dorset."

Deiopeia pulchella.—Six specimens. One from the Sellon Collection, on an old common pin, labelled "Standen's Collection"; another label, apparently Standen's, has on it "Taken by Dr. Battersby at Torquay." A second from the Sellon Collection has a label "Folkestone, -/8/84 taken by V. R. Prince." Two from the Spilsbury Collection, one labelled "from Mr. Brockhoules' Collection, Westmoreland, bred by the Revd. — Tristram. ♀ caught at Torquay, which laid 14 eggs. From Mr. Hodgkinson." Two from the Hope Collection with no data.

Hipocrita jacobææ.—Two specimens have yellow hind wings and a yellow stripe and spots on the fore wing. One is from the Hope Collection. The other from near Southampton, taken about 1889 by the Rev. G. Hughes.

Cybosia mesomella.—A male and two females from the Hope Collection are Haworth specimens. The male has yellow fore wings, and is labelled by him "*eborina*." One of the females is labelled, also by him, "*flavescens*."

Lithosia deplana.—A fairly long series with considerable variation. A very large female from the Sellon Collection, taken in the New Forest, and another from the Meldola Collection taken at Horley, Surrey, have very dark greyish-brown fore wings with a strong dark yellow stripe along the costa extending to the apex, the hind wings being darkish grey. Two females from the Meldola Collection taken at Boxhill have rather bright yellow forewings (resembling pale specimens of *L. sororcula*) with paler hind wings. From the Hope Collection is a Haworth specimen labelled by him "*helvola*."

L. griseola.—A Haworth specimen is labelled by him "*ochreola*."

L. griseola, ab. *flava*.—There are two Haworth specimens, one of which is labelled by him "*flava*, F."

Lithosia sericea.—Six specimens from Warrington. Four others from Chitty and Sellon Collections, unlabelled.

L. caniola.—A long series from S. Devon. One pure white = ab. *lacteola*, Boisd., a female, was taken by myself last August near Paignton. From the Meldola Collection are three specimens labelled "Romney Marsh 1895."

Lithosia sororcula.—A Haworth specimen labelled by him "*Aurantina*. Pr."

Pelosia muscerda.—Two of the specimens from the Meldola Collection are labelled, one "Eastry, Kent, 1903," the other "Kent 1907."

(To be continued.)

NOTES ON THE VARIATION OF *PERONEA CRISTANA*, FAB., WITH DESCRIPTIONS OF SIX NEW FORMS, AND THE REASONS FOR SINKING THE NAMES AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from vol. liii, p. 271.)

Ab. lichenana, Curtis. Webb writes of this (*loc. cit.*, vol. xliv, p. 309): "May perhaps be identical with *subvittana*, Stephs." This is another case of not looking at the original description.

Curtis describes *lichenana* as having a dark button, whereas *subrittana* has a cream-coloured, or, as Stephens says, a whitish one.

Ab. ruficostana, Curtis. Webb (*loc. cit.*, vol. xliii, p. 368) criticises Clark for creating a new name for the white vitta form of this group thus: "Curtis says of the type of *ruficostana*, 'inner margin white,' but Clark, that the true *ruficostana* is yellow." Which is correct? If Curtis stands, *alboruficostana*, Clark, must fall, but for many years that with the white vitta has been in our cabinets as the typical form; the description must stand before any plate."

This is one of the least logical statements in the whole paper and should be wiped out from memory. Curtis, in 'British Entomology,' first edition (1824), plate 16, figures the yellow vitta form as *ruficostana*. There can be no doubt about this: the figure is a very beautiful one, and the vitta is lemon-yellow. In his description, however, No. 24, he says: "Inner margin (= vitta) white." It is to be presumed that he figured a yellow vitta example, and described one with a white vitta, overlooking the discrepancy. There may be something of weight in suggesting that when the average author describes a feature as white it should stand before his figure which makes it yellow, but in the case of Curtis it is different. The average author in writing on Lepidoptera gets an artist to produce his plates, whereas he writes his own descriptions, and thus an error is more likely to occur in the former than in the latter. But Curtis was his own artist, and whilst his figures are the finest that have ever been produced in any entomological book in Britain, so exquisitely executed that there can be very little doubt as to the particular species he intended to represent in any one of them, the same excellence does not apply to his descriptions, which are in many cases only outlined. Unquestionably a figure that proceeded from him should stand before any of his descriptions when the two diverge. There is the additional objection to Webb's suggestion, that its adoption would leave the form with a yellow vitta without a name, and a new one would have to be found for it. His remark that the form with the white vitta is the one that has been in our cabinets for many years as the type is no doubt correct, but that is not a reason why the error should be perpetuated.

Ab. ruficostana, Curtis (with the yellow vitta), is by far the rarest form of the two. Out of several thousand examples of *cristana* forms examined in the five years I have studied the species, I have only come across one specimen, which came from the New Forest, whereas of the forms with the white vitta I have picked out about thirty. Mr. South has two examples of *ruficostana* from the New Forest.

The descriptions of Desvignes constitute one of the chief difficulties experienced by students of the variation of *cristana*;

they are the veriest outlines, in some cases consisting of less than half a dozen words, but they usually enumerate the differences of the form described from some other previously known form, and I find that by looking up the descriptions of these latter and studying them carefully one can understand Desvignes' meaning.

The investigation has, however, its difficulties. Desvignes was only acquainted with a comparatively few forms, or, as he considered several of them, species, and as since his day many other forms somewhat similar to those he described have been named—one suspects without understanding what his forms actually were—and others known to him are no longer found, it is sometimes difficult to understand him. Unfortunately his very large collection of the *Peroneas* has disappeared, and the whereabouts of the specimens, if they exist, is not known.*

I have devoted a good deal of time to studying his meaning, and I think, thanks largely to the Webb specimens, I have succeeded in elucidating it. The forms which have hitherto appeared to me not understandable are the following: (1) *unicolorana*, (2) *xanthovittana*, (3) *curtisana*, (4) *tolana*, (5) *provittana*.

To take these in the order as given:

(1) *Ab. unicolorana*. Desvignes writes of this: "Its colour being uniform dark GREEN." It seems evident that for the word "green" should be substituted the word "brown," because apart from the question that a green form of *cristana* is not only not known and is quite outside the colour variation of even this protean species, Desvignes goes on to write of the next aberration, *alboflammana*: "Similar to the preceding, with a white dash on the inner margin." Now *alboflammana* is one of Curtis's names, and his description of it is: "Superior wings livid BROWN, with a small button on the disc." This of course settles definitely the doubtful point.

(2) *Xanthovittana*. Desvignes says of this: "Similar (to *alboflammana*), with a yellow or fulvous dash; palpi, head and thorax of the same colour." To this description one must of course add that of Curtis's of *alboflammana* given above, and we then find that *xanthovittana* is a form with livid brown wings, a small button on the disc, and a yellow or fulvous vitta, palpi, head and thorax. This description exactly agrees with Clark's *ab. proxanthovittana*, which must fall before Desvignes' name. Clark, of course, was under the impression that *xanthovittana* had a large button.

* Since writing the above I find in E.M.M., vol. v, p. 26 (1868), it is stated that "Desvignes's Collection of British insects will shortly be sold at Stevens's," and in the same volume, p. 180, that "S. Stevens exhibited at a meeting of the Entomological Society of London a Geometer from Desvignes's cabinet." It would appear most probable that his *cristana* were included in this sale, that they were then distributed amongst the buyers of that species, and that a number of them would find their way eventually into the Webb series.

(3) *Curtisana*. I have already given the reasons why I consider *ab. charlottana*, Clark, should fall before this.

(4) *Tolana*. The identity of this form has puzzled many students of *cristana*, including Clark and Mason, neither of whom knew it; but there can be no reasonable doubt but that Webb's definition of it (*loc. cit.*, vol. xliii, p. 199) is the correct one.

(5) *Provittana*. This aberration seems to be very imperfectly understood. Webb in his paper (*loc. cit.*, xliv, p. 291) does not attempt to define it, but the series of examples so labelled in his collection do not agree with Desvignes' description, and are very near to *fulvostriana*, Dsvgs.

The form that usually passes muster in our collections for *provittana* is a rusty insect in every way resembling *semiustana*, Curt., but with a cream-coloured vitta, head and thorax, but this again does not agree with the original description by Desvignes, who says: "*Peronea profanana*. Var. 1, *profanana*, Fab., cinereous, with tufts of scales of the same colour. Var. 2, *provittana*, Des., similar, with a yellow dash." To realise what *provittana* is we must first find out what *profanana*, Fab. is, and what Desvignes thought it was. Fabricius's description is as quoted by Desvignes: "Alis cinereis; puncto medio fusco." Now what does Fabricius mean by "cinereis"? One would think ash-coloured, or gray without any tinge of brown; but if one turns to 'Ent. Syst.' and runs through it, and especially through the descriptions of the Pyrales, Crambites and Tortrices, which were written approximately at the date on which he wrote that of *profanana*, one finds quite a number of species in which this word is used, some of which are pure grey, but others are distinctly tinged with brown—for instance, *Crambus pratellus*, *C. pascuellus*, *Z. grisealis*, *A. pinguinalis*, and *T. crataegana*.

Turning next to the figures of *profanana*, and the descriptions of it, at the date that Desvignes wrote (1845), one finds in Wood, 'Index Entomologicus,' fig. 1047 (1839), a distinctly brown insect, it is moreover both in this work and in Westwood a few years later, named the "rusty button." Stephens ('Haust,' vol. iv, p. 149, (1834), speaks of it as rusty griseous. Wood's figure (*loc. cit.*) shows a dark base, costal blotch, and apex; and Stephens (*loc. cit.*), alludes to these dark markings, and there can be little doubt but that when these authors' works appeared these were held to be the characteristics of *ab. profanana*. These dark cloudings are not mentioned by Fabricius, and therefore they should not apply to the type, but I think we must consider what was in Desvignes' mind when he named *ab. provittana*, and there can be but little doubt that he saw a form with these darker blotches.

It is evident that in translating "cinereis" we must use a considerable amount of latitude and include anything that is grey or greyish brown, and so *provittana* becomes, I take it, a form with greyish-brown superiors, blotched with darker brown and

with a yellow vitta. There are in Webb's series about half a score examples which answer to this description; most of them were included by him amongst those he had labelled *nigropunctana*, Clark. They are all old specimens, without data, with the exception of one, which has Webb's label attached to the pin, "*xanthovittana*, Clark."!

The latitude which I suggest should be given to the ground *profanana* would, I think, rule out *ab. sepiana*, Sheldon, which name should be discontinued.

Ab. sequana, Curtis. This form requires eliminating from the lists. In 1834 Duponchel figured in 'Hist. Nat.,' pl. 244, fig. 2, a *Peronea*, which in vol. ix, p. 157, he describes as *P. combustana*, and gives as its synonyms *T. combustana*, Hüb., *T. byringerana*, Hüb., *T. sparsana*, W. V., *T. hastiana*, Frol., *Peronea combustana*, Stphs., and *P. byringerana* Stephs.; but these are all a form of *P. hastiana*, L.! *Combustana*, Hüb. (Fig. 234), has a very striking superficial resemblance to Duponchel's figure, which is, however, obviously a form of *cristana*, with a well-developed button. As a matter of fact it is identical with the form Curtis (after 1834) named *sequana*, which therefore must fall before it.

There cannot be any doubt about the identity of these forms. The figure, like most of Duponchel's, is an extremely good one, it portrays an average *ab. sequana* in every respect, except that the button is slightly paler in tint, but I have examples with the button exactly of the colour of Duponchel's figure; he was, no doubt, led into the error of mistaking one species for another by the superficial similarity of his specimen to Hübner's figure.

(To be continued.)

NOTES AND OBSERVATIONS.

AGRIADES CORYDON AB. SEMI-SYNGRAPHA IN SUSSEX.—Seeing Mr. Oliver's note on *A. corydon* ('Entom.,' vol. liii, p. 283) reminds me that during the past season *A. corydon* has disappeared from a spot on the South Downs, near Ditchling, Sussex, which in 1919 was such a prolific colony that it was really difficult to net single specimens without taking others at the same time. I do not think that I missed the season for this insect, for I visited the spot almost weekly from late June to late August, being rewarded by one very poor female on August 14th. Last year *ab. semi-syngrapha* was taken here by my friend, F. Wood, and we both noticed other specimens, though the full var. *syngrapha* was apparently not in evidence.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford Hill, London, S.E. 6.

CHRYSOPHANUS DISPAR, HAW.—Mr. N. D. Riley ('Entom.,' vol. liii, p. 10, 1920), in his note on the "so-called Dutch" *C. dispar*, differentiates this form from our extinct fenland type form. It is, therefore, of considerable interest to British collectors to observe that M. Charles

Oberthür, whose authority is unquestioned, takes a different view, and identifies the Dutch with the British "Large Copper." Writing in the 'Bulletin de la Soc. Ent. de France' (1920, No. 15, pp. 254-5) he says: "Finally, the *C. dispar*, conforming absolutely to the extinct English race, has been discovered in Holland. I have been able to compare a superb Dutch male, for which I am indebted to the courtesy of M. Van Eecke, of the Leyden Museum, with old English examples included in my collection. It appears to me impossible to determine any difference between the Dutch and English *C. dispar*." I may add that in the fine collection which was left me by the late Rev. F. E. Lowe, of Guernsey, there are five magnificent specimens of *C. dispar*, which came into his possession from the Mason Collection—three males and two females.—H. ROWLAND-BROWN; Harrow Weald, December 11th, 1920.

CURIOUS LATE EMERGENCE OF *PAPILIO ALEXANOR*.—We have had a very wet and stormy autumn, and to my surprise during an awfully cold week of east wind a fine *P. alexanor* emerged in the garage on the north side of the house on November 1st, I cannot say if from this season's pupæ or last, as some which did not hatch of last year's still remain spun up with those of this year. It struck me as extraordinary in such cold weather.—C. E. MORRIS; Villa Chatelet, Le Cannet, Alpes-Maritimes, November 1st, 1920.

[Is it possible that *P. alexanor*, a single-brooded species in south-east France, and I believe generally, sometimes attempts a second emergence after the fashion of *P. machaon*, the only other double-brooded species of this Swallow-tail group in the western palaearctic region?—H. R.-B.]

CHRYSOPTERUS PHLEAS, L., VAR., OR AB. CERULEO-PUNCTATA.—This species is, in its typical state, common in my garden and grounds, particularly affecting a large herbaceous border in the kitchen garden, which slopes towards the south-east, and is bordered on that side by the Rea Brook, a tributary of the Severn, its banks margined with thick growth of reed-mace and many other moisture-loving plants. Beyond stretch water-meadows, often inundated. It is only in the above-mentioned herbaceous border I have found the blue-spotted form, and very fine, well marked and large some of the examples are. Such fly about, often sporting in a somewhat pugnacious manner with typical specimens. My experience therefore tallies with that of Mr. S. Jacobs ('Entom.,' vol. liii, p. 233) and Mr. W. Pierce (*ibid.*, p. 285). May I be allowed to express the hope that a good proportion of the 537 mentioned as having been captured by the former gentleman were allowed their freedom after having been examined, and were not immolated on the altar of critical research, as there can be no doubt that in some places the Lepidoptera—and more particularly the Diurna—are being over-collected, and consequent dearth, if not absolute extinction, is sure to follow in the long run.—J. COSMO MELVILL; Meole-Brace Hall, Salop.

BRENTIS (ARGYNNIS) SELENE, SECOND BROOD AT ABBOTT'S WOOD.—When visiting these woods on August 8th with my friend Mr. E. P. Sharp, of Eastbourne, we found *A. selene* flying in considerable

numbers, and had no difficulty in selecting some sixty specimens in a couple of hours in the morning. This brood was apparently confined to one large rough field, as in the afternoon we explored other parts of the woods where the spring brood has been abundant without seeing a single *selene*. On the 11th there seemed to be a still greater number on the wing. On neither occasion did I notice any varieties, but I believe some were taken subsequently by local collectors. Mr. Sharp tells me that the spring brood was out in great numbers between May 23rd and June 6th. It seems possible that as June and July were cold and wet the vegetation would receive no check to its growth as in hot and dry summers, when previous second broods have been recorded, and this may account for the large number of this 1920 August emergence. Looking back through various magazines I can only find records of one or two at a time, except in 1911, when 30 were recorded from Ilfracombe.—H. WORSLEY WOOD; 31, Agate Road, Hammersmith.

COLIAS EDUSA AND *AB. HELICE*.—The experience of friends of myself in this district this season with these insects may be of interest. On August 8th, after an absence of three years, I first saw *edusa* at Halland, near Uckfield, Sussex, and later in this district I saw about twelve, of which I secured three good specimens, one ♀. On returning to Brighton on August 13th I renewed my search, and from that date to the end of September I saw altogether about thirty-six, of which I secured twenty. On September 5th I obtained three worn ♀, and decided to see if ova were produced, and during the next fortnight I was successful in obtaining a goodly number, but many were not fertile. Altogether about three dozen hatched, of which I retained one-third and gave the others to friends. From October 20th mine pupated, and at the present time of the whole number sixteen have emerged, the first on November 11th, one being *ab. helice*, and the last yesterday, a ♀. I still have three pupæ which are changing and should emerge this week. At first the larvæ were fed on *M. sativa*, but later the food was changed to *L. corniculatus*, which they took more readily to. Friends of mine saw many *edusa* in this district during August and September, one securing so many as nine dozen. Altogether, including the one referred to, there have been eleven *ab. helice* taken this season in the neighbourhood of Brighton.—LOUIS MEADEN; Melbourne, Dyke Road, Preston, Brighton, November 19th, 1920.

[Since sending the above note, Mr. Meaden reports two other specimens of *helice* reared by friends from larvæ he had given to them.—ED.]

COLIAS EDUSA, *PYRAMEIS ATALANTA* AND *AGLAIS URTICÆ* IN CAMBRIDGESHIRE, GUERNSEY, AND NORTHERN FRANCE.—The following notes may have some interest in connection with those which have recently appeared in the 'Entomologist.' The only *Colias* that I have seen in England this year was one specimen of *C. edusa* flying beside the Newmarket Road, about four miles from Cambridge, on August 26th. Inquiries made of several naturalist friends have not produced any other evidence of this butterfly being seen in the district this season. Mr. Michael G. L. Perkins tells me that it was abun-

dant in Guernsey during August and September, but that he cannot recall having seen any *helice* or *hyale* there. From September 3rd to 15th I was in Normandy, in the wooded country on the right (north) bank of the Seine. But though the weather from September 7th onwards was very fine no great profusion of *C. edusa* was observed. During that time about a dozen specimens in all were counted at several places between Lillebonne and Rouen. No *helice* or *hyale* were seen. Cambridge shared, at any rate moderately, in the general abundance of *P. atalanta* this season. The well-known attractiveness of the flowers of *Buddleia* to this butterfly was strikingly demonstrated on August 15th in the Botanic Garden, when two large *Buddleia* bushes, more than a hundred yards apart, where entertaining altogether ten or twelve *atalanta*, as well as several *Vanessa io* and *Pieris brassicae*, but no *atalanta* or *io* were to be seen anywhere else in the garden, though this is of considerable extent, and was then very flowery. *P. atalanta* was plentiful in France during my stay. The flowers of *Eupatorium* (Hemp Agrimony), which was very abundant in places, seemed to be specially attractive to these insects. About September 9th fresh-looking specimens were seen, six to a dozen together, settling on great clumps of this plant beside the road along the bank of the Seine near Caudebec-en-Caux. Subsequently, between September 19th and 23rd, single specimens were noticed in the heart of Paris, flying over the flowers in the Jardin des Plantes and the Luxembourg Gardens. *Aglais urticae* is only mentioned to chronicle a rather late appearance. One of these butterflies was flying rather feebly, and sunning itself on stones, in the Cambridge Botanic Garden on October 24th. No other butterflies were in evidence, but on ivy-blossom near by were numbers of wasps and bluebottles, and a large queen *Bombus* having the *terrestris*-type of colouring.—HUGH SCOTT; University Museum of Zoology, Cambridge.

TRIGONOPHORA FLAMMEA IN SUSSEX.—Last week I received a specimen of *Trigonophora flammea* from Chailey, Sussex. Beyond being slightly faded it is in good condition, even to legs and antennae. It was found hanging in a cobweb in a loft, and by its faded colouring I should say it had been there since last year. Fortunately the web was untenanted by any spider, nor had the bats which frequent the loft touched it. It has relaxed and set quite well.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford Hill, London, S.E. 6.

NOTES FROM CHINNOR, OXFORD.—I am glad to report the capture of *Thecla pruni* and *Limenitis sibylla* in a new locality, a collector having brought me fifteen of the former and four of the latter that he had taken. No doubt Mr. Rowland-Brown will be glad to read that *Melanargia galatea* seems to be rapidly spreading over many parts of the Oxfordshire Chilterns where formerly it did not occur. *Pararge megæra* also, which apparently had gone, is now quite common again. On the other hand *Agriades corydon* has failed to appear on the Bucks Chilterns, where it generally swarms, although across the valley it was as common as usual on the Oxfordshire Chilterns. *Colias edusa* has put in an appearance; it frequented the same places where I took this species in 1919. I found a colony

of *Epione advenaria* amongst young ash trees. Obtaining ova I successfully reared them on ash, which is, I presume, their food-plant in that locality. I failed to find larvæ of *C. lychnitis* this year, although I left a goodly number the previous year to carry on the species. Possibly they are holding over for another year, as out of sixty pupæ only one imago emerged this season. I always find that more than half the number stay a second year in the pupa state. *Agrotis obscura (ravida)* was formerly so plentiful here that I have captured more than 200 in a season, but for the past few years it has appeared very sparingly indeed, my captures being only two or three each season.—A. J. SPILLER; Chinnor.

MARGARODES (GLYPHODES) UNIONALIS AND LEUCANIA VITELLINA IN SOUTH DEVON.—I took two fine *M. unionalis* at ivy in October. The first was taken on the 12th and the second the following night. Wet and windy weather followed and probably destroyed all chance of further captures of this species. Excepting a solitary *Botys asinialis* nothing of note was seen until October 22nd, when my father, Mr. E. J. Milman, called my attention to a *Leucania vitellina* feeding greedily at ivy. We had never before seen this usually skittish moth at ivy. Noctuæ, with few exceptions, have been very scarce throughout the year, and many captured females have proved infertile.—P. P. MILMAN; Cyprina, Lower Conway Road, Paignton, November 16th, 1920.

BUTTERFLIES IN SOUTH CORNWALL.—From August 14th to September 4th, 1920, I visited South Cornwall. The first week was spent at Penzance, the second and third at the Lizard. Although the weather was generally fine the temperature was low for the district, and the prevailing winds were N. and N.E., so that conditions were not ideal for butterflies. The first capture was a fine specimen of *P. cardui*, secured with a pill-box (!) on the Land's End. During my stay I took or noted nineteen species. Owing to the winds the sheltered valleys leading to the coves were the most favourable collecting-grounds. Two visits to the Try Valley, mentioned by Mr. G. B. Kershaw in the 'Entomologist,' 1912, proved unfortunate owing to bad weather, although the district looked very promising. A fine day on August 18th in the Lamorna Valley brought thirteen species on the wing, many abundantly. At the Lizard I found the Caertilian Valley a favourable and handy locality. Here *C. edusa* had evidently bred; I saw altogether about a score and took four in perfect, fresh condition. Of the Pierids *P. brassicae* was the common one everywhere, *rapæ* only scanty and *napi* few and worn. All showed the summer variation. *P. megæra* and *P. egeria* swarmed in all parts visited, the former along the Cornish wall-hedges and the latter in more shady places as usual. I took a series of fresh *Egeria egerides* in a small wood at Lamorna, and found the light markings distinctly darker and more fulvous than in specimens I have taken elsewhere. *E. tithonus* abundant everywhere. A few *C. pamphilus*. *E. jurtina* common but getting over. *H. semele* common locally at Mullion and elsewhere. *P. atalanta*: I never saw this species in such abundance. *P. cardui* also common and generally distributed. *V. io*: A few here and there. I captured a few for inspection and found none with the blue spot on the hind wing (ab. *cyano-*

sticta). *A. urticae* : Scarce. *D. paphia* : Several at Lamorna in very fair condition. Some seemed fresh. *A. aglaia* : Common at Caertilian. *P. icarus* : Abundant. A few minor variations of the female noted. Elongation of spots on underside, absence of dark scaling on upper side, etc. *C. phleas* swarmed at Caertilian, the blue-spotted form being frequent. A few *A. flava* at Caertilian concludes my list. The abnormal weather conditions this year will no doubt explain the somewhat unusual dates for some of the species mentioned.—E. OCTAVIUS CROFT, M.D., F.E.S.; 12, North Hill Road, Headingley, Leeds.

BUTTERFLIES IN THE ISLE OF PURBECK.—The following account of the butterflies taken and of those noted during a month's stay in the Swanage district between August 3rd and 31st, 1920, may be of interest. *P. brassicae* and *P. rapae* were common. *P. napi* scarce. *Vanessa io* and *A. urticae* scarce. *P. atalanta* and *P. cardui* abundant, and of the former a large proportion had a white spot in the red band of the fore wings. *M. galatea* common. *C. edusa* was common; thirty-eight were taken by myself and twenty-one by my nephew, who was with me during the latter part of my visit. Of these, four were var. *helice*, two being very fine specimens. Several specimens taken were released, being worn or otherwise damaged. Between August 14th and 26th eighteen specimens of the second brood of *C. minimus* were taken and others noted. *P. ægon* was taken in good condition as late as the 24th, including a dwarf male with curious under-side markings. *A. corydon* was not abundant, but some interesting forms were taken: Six males with orange markings in the spots above the black border on the outer margin of the hind wings; four males with the spots on the hind wings running into the black outer border without white markings; one male with white fringes on the fore wings with a black border on the outside of the fringes; one male var. *fowleri*; one male, fore and hind wings, underside, streaked with brown. *P. icarus* was common without much variation, except one female with the orange spots on the fore wings much enlarged and wedge-shaped, the orange colour extending to the discal spot. *E. jurtina* was common, and one specimen having half the left fore and hind wings bleached was taken. *A. flava* and *T. actæon* common. *C. phleas* scarce. A few *A. bellargus* had emerged before the end of the month. Larvæ of *A. urticae* were taken on August 15th, and up to September 22nd 103 imagines out of 105 pupæ had emerged, all being typical. It was a pleasure to note the total absence of ichneumonid larvæ—a very different experience from that of myself and other collectors last year with this species.—A. M. LONGHURST; Artro, St. James' Avenue, Hampton Hill.

ERRATUM.—Page 280, line 3 from bottom, for "who has been there," read "who has seen them."

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—September 9th, 1920.—Mr. Stanley Edwards, F.L.S., Vice-President, in the Chair.—Mr. J. B. Farmer, of Brixton, was elected a member. Mr. Bowman

exhibited a series of the spring-emerged half of a brood of *Ephyra porata* from ova, and remarked on their close resemblance to the allied *E. punctaria*.—Mr. Main, larvæ of three parasites (Hym.) which attacked the Longicorn (Col.), *Rhagium inquisitor*, in Epping Forest.—Mr. Turner, many species of Heterocera taken by Mr. Grosvenor in India, chiefly Bangalore, including *Attacus edwardsi*, *Trebala vishna*, *Grishna macrops*, *Zygæna cashmirensis*, etc.—Mr. H. Moore, *Mutilla europæa* (Hym.) from Bournemouth, with other *Mutilla* species from Egypt, Upper Amazons, Indiana and the Ionian Isles.—Mr. Carr, pupæ of the cheese-mite, *Piophilæ casei* (Dip.).—Mr. Bunnett, the black aberration of *Coccinella hieroglyphica* (Col.) from Keston with the type.

September 23rd.—Mr. K. G. Blair, B.Sc., President, in the Chair.—An exhibition of lantern-slides.—Mr. R. Adkin, views of old Selborne.—Mr. Tonge, resting habit of several British Geometers.—Mr. Main, seasonal forms of *Pieris napi*, stages and pupal chamber of *Timarcha lævigata* (Col.), ravages and metamorphoses of *Donacia*, sp. (Col.).—Mr. Withycombe, *Chrysopa*, *Hemerobius*, *Syrphus* and *Stratiomys*.—Mr. Colthrup, positions of rest of butterflies and moths.

GENERAL EXHIBITS.—Mr. Grosvenor, many species and forms of the genus *Terias* from India.—Mr. Bowman, a bred series of *Trichopteryx carpinata* from Oxshott with numerous forms having well-emphasised transverse lines on the fore wings.—Mr. H. J. Turner, three species of *Eacles* (Lep. Het.)—*E. imperialis*, N. York, *E. grandis*, São Paulo, and *E. sp. ?* from Cordoba, Argentine, sent by Mr. Lindeman, with coloured photographs of the larvæ of the last two.

October 14th.—The President in the Chair.—Mr. J. B. Farmer presented a box of British Odonata to the Society's collection.—Mr. Riley, on behalf of Mr. South, for Mr. Dolton, aberrations of (1) *Agriades corydon*, between ab. *albicans* and race *apennina*; (2) *Hybernia leucophæaria*, conspicuous wavy lines on a clear ground; (3) dark grey-brown *Bupalus piniaria*.—Mr. Turner, a small race of *Zygæna filipendulæ* from Boxhill, with sixth spot very feebly developed, including ab. *cytisi* and other aberrations.—Mr. Newman, living full-fed larva of *Hyloicus pinastri* from Suffolk.—Mr. B. S. Williams, three *Pieris rapæ* showing a discal spot on the hind wings, and a striate, asymmetrical form of *Rumicia phlæas*.—Mr. Johnson, banded females of *Pieris napi* from Ireland, one being yellow suffused, confluent *Zygæna trifolii* from Folkestone, and a gynandromorph of *P. rapæ*.—Mr. Grosvenor, *Pieris canidia*, various forms, *P. kroeperi*, and *P. rapæ* from India.—Mr. Mera, *Polia chi* closely approaching form *olivacea*.—Mr. Blenkarn, *Carabus nitens* and other Coleoptera from Poole.—HY. J. TURNER, Hon. Editor of *Proceedings*.

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1919–20. Pp. xvi + 104, 2 plates.

As in previous years a number of useful papers were read, that of Dr. Boulenger, F.R.S., on "British Batrachians," being one of the most interesting. E. J. Bunnett, M.A., and R. Adkin contributed

biological papers on Lepidoptera, while B. W. Adkin, and the President (S. Edwards) in his address, treated of the economic side of insect life. F. W. Torrington catered for the botanists in a lecture on "British Fern Varieties," while F. W. Frohawk did the like for ornithologists in his paper on "Migration of Birds." The "Abstract of Proceedings" (in places requiring a little more care in editing) contains a mass of useful information, which all naturalists would do well to consult.

W. J. L.

Transactions of the London Natural History Society, 1919.

THOUGH not a bulky volume—45 pp.—this issue shows clearly that interesting and useful work is being done to elucidate the natural history of the district, which the members have mapped out for themselves. Such active practical work testifies to the vitality of the Society. Judging by this volume the work falls under four heads: Entomology, Botany, Ornithology and Archæology. Perhaps it is a little disappointing that the entomologists seem to have confined their attention almost entirely to two directions only—Lepidoptera, and galls and other cases of parasitism, though, of course, the latter is one of the most important branches of entomology. The volume appears to be carefully edited.

W. J. L.

Annals of Tropical Medicine and Parasitology.

A FEW articles of interest to entomologists have appeared of late: In vol. xiii, No. 3, December 10th, 1919: (1) "Notes on the Bionomics of *Stegomyia fasciata*, Fabr." (Part I), by J. W. Fielding, pp. 259–296.

In vol. xiii, No. 4, March 15th, 1920: (1) "The Experimental Infection in England of *Anopheles plumbeus*, Stephens, and *Anopheles bifurcatus*, L., with *Plasmodium vivax*," by B. Blacklock and Henry F. Carter, pp. 413–420. (2) "Observations on *Anopheles (Calodiaezis) plumbeus*," Stephens, with Special Reference to its Breeding-places, Occurrence in the Liverpool District, and Possible Connection with the Spread of Malaria," by B. Blacklock and Henry F. Carter; pp. 421–452, illustrated. (3) "Descriptions of the Male Genital Armatures of the British Anophelene Mosquitoes," by Henry F. Carter; pp. 453–457, illustrated.

In vol. xiv, No. 1, June 30th, 1920: (1) "The Nomenclature of the Parts of the Male Hopopygium of *Diptera nematocera*, with Special Reference to Mosquitoes," by F. W. Edwards; pp. 23–40, 2 illustrations. (2) "Heat and *Stegomyia fasciata*: Short Exposures to Raised Temperatures," by J. W. S. Macfie; pp. 73–82. (3) "On the Results Obtained from Surveys for Breeding-places of Tree-hole Mosquitoes in Liverpool and Neighbourhood," by B. Blacklock and Henry F. Carter; pp. 115–126, illustrated.

W. J. L.

A Catalogue of the Butterflies of Berkshire, with Notes as to Habitats, Localities, History, Aberrations, Dates of Appearance, etc. By J. E. H. BLACKIE. In type-written MS. Price 1s., from the Author, The Vicarage, Windsor.

WE have received the above type-written list of the butterflies of

Berkshire from the author. It is a careful compilation of pretty well all the information published on his subject, to which are added many useful personal notes and observations. It can be strongly recommended to the notice of local collectors, and to all those interested in the insular distribution of our limited British catalogue of butterflies. Mr. Blackie pays particular attention to local forms occurring in the county, and for this reason, if for no other, his remarks under this head are of special interest.

OBITUARY.

GEORGE B. BROWNE was born August 1st, 1851, and from his youth was a lover of country pursuits, but it was not until early middle life that he commenced to study the British Lepidoptera. He ascribed the awakening of his interest in the subject to the appearance one day in his garden at Lee, in South-East London, of a brilliant ♂ *Apatura iris*—a most unlikely butterfly to occur within the boundaries of London—and when at a later date it was followed by a specimen of *Evanessa antiopa*, which settled upon the trunk of a tree and was captured by one of his sons by means of a glass tumbler, he was so delighted with the beauty of colouring of the insects that he commenced to collect and study them—a pursuit he followed with undiminished ardour and enthusiasm to the end of his life. In the year 1900 he became a member of the South London Natural History and Entomological Society, and was a familiar figure at its meetings until his removal from London to Benfleet about six years ago. He was, perhaps, best known to his entomological friends as an indefatigable field worker, much of his collecting being done in the neighbourhood of Deal, in Kent, of which district and its lepidopterous fauna he had an extensive knowledge. He was also for many years a frequent visitor to Wicken Fen, and for a time was the owner of some of the fenland there, but a few months before his death the property was transferred to the National Trust, his failing health preventing him from paying further visits to the neighbourhood. On one occasion, when at Wicken, he came across a specimen of *Acronycta strigosa* at rest high up on the trunk of a tree, and after a good deal of difficulty managed to secure it, but it was not until he had returned to his lodgings that he discovered the identity of his capture. Until about four years ago he was remarkable for his vigour and apparent robust health, but an internal disorder which necessitated an operation in 1916 seriously undermined his strength, and lessened his power to resist an attack of pneumonia, which led to his death on Saturday, December 4th, 1920. A man of singularly amiable nature, unassuming, yet intensely practical in the affairs of life, as became his profession of a banker, he was never so happy as when introducing his friends to his best collecting-grounds, and helping them to capture some of the “good things” he had himself taken there. He will always be remembered by them with affection, and his death will be regretted by all who knew him. A. L. R.

CONTENTS.

(0) 117-118, 24

FOR SALE.

Two 8-drawer Second-hand Cabinets,

Suitable for beginners or for keeping duplicates. Cheap.

ESSON, G. ESSELMONT AVENUE, ABERDEEN.

CABINETS. Finest Materials. Best Workmanship
Any size made to order.
Drawing on application.

PUPÆ.

Box and Postage add. extra

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.,

FEBRUARY, 1921.

No. 693.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c.

DR. D. SHARP, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U.

N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON.

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Double Number.

Price Three Shillings Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, &c. &c.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

BEXLEY, L. W. NEWMAN, F.E.S., KENT.

Finest Stock of **Set Insects, Ova, Larvæ and Pupæ**
of British Macro-Lepidoptera in the Kingdom.

Price Lists on application.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH

FOR SALE.—All fine set per each.—Orion, Acens, Neglecta, Nigra, Croceago, Aurago, Socia, Fuscantaria, 4d.; Euerterius, Versicolor, Eucula, Ripa, Anemola, 6d.; ? Sumata, Quercana, Lychinitis, 6d.; Cucullina, Camilita, Leporina, Olpecta, Retusa, Cracca, 9d.; Heng, Abu, Laponaria, Radiata var., 1s. Nearly every other species on hand.

A. J. SPILLER, CHINNOR, WALLINGFORD.

THE ENTOMOLOGIST.

VOL. LIV.]

FEBRUARY, 1921.

[No. 693

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

Colaspsis, Fabr.

SOME of the unplaced forms on p. 34 of M. Clavareau's list figure out as follows: *Ænea*, Fab., probably a form of *trivialis*, Boh.; *castanea*, Boh., occurs at Cachabe, Ecuador; *ferruginea*, Fab. = *Colaspoides vulgata*, Lef. ?; *fulva*, Fab. = *Eriphylina*?, sp.; *fuscitarsis*, Boh., *geminata*, Boh., and *rustica*, Boh., all are valid species from Rio; *humeralis*, Lec., and *puncticollis*, Say., belong to *Nodonota*; *lateralis*, Germ., might be *Sibotes ater*, Lef. ?; *rugosa*, Germ., is a well-defined form with a somewhat curved metallic-green stripe from the shoulder nearly to the apex; *unicolor*, Oliv., a Cuban form nearly allied to *trivialis*, Boh., *oregonensis*, Cr., and *chrysis*, Oliv., would seem to be more naturally placed in *Talurus*, Lef., than in *Colaspsis*.

Colaspsis humeralis, Baly. = *Agbalus*.

Colaspsis geminata, Lef., nom. præoc. = *Lefevrei*, Bow.

Alethaxius verrucosus, Jac. = *Colaspsis nigrimana*, Lef.

Colaspsis aureopunctata, Lef. = *Campylochira* ♀.

Campylochira fulvicornis, Jac. = *aureopunctata*, Lef.

Mr. Lefevre, in his description of *Colaspsis interstitialis*, 'Ann. Fr.,' 1876, p. 141, speaks of the dilation of the hind tibia of the ♂. The males of the following species show something similar:

Colaspsis æruginosa, Germ.—Inner edges dilated at middle third, the rear declination rather abrupt.

C. viridissima, Lef.—Inner edge bluntly dilated a little behind the middle, the front and rear declination even.

C. townsendi, Bow.—Inner edge feebly dilated at about the middle.

C. lebasoides, Bow.—Inner edge gradually dilated to posterior third, then of even width to end.

C. interrupta, Har.—Gradually dilated from middle to end.

C. haroldi, Jac.—The type is ♀; what I consider the ♂ has hind femora with a bifid tooth, tibia rather strongly sinuate both ways at either end of the middle third.

C. interstitialis, Lef.—Inner edge feebly dilated and sinuate at beginning of posterior third.

C. trivialis, Boh.—Inner edge strongly dilated and outer sinuate at the middle third, the rear decline being most abrupt.

C. goyazensis, Bow.—Both edges very feebly sinuate at the posterior third, nearly the same width throughout.

C. geminata, Boh.—Inner edges very gradually dilated to posterior third, then slightly sinuate and straight to end, the outer edge nearly straight.

C. inconspicua, Jac.—Inner edge evenly brought to a point in the middle and sinuate at rear end.

C. dilatipes, Bow.—Inner edge strongly dilated, occupying the posterior part of the middle and anterior part of the rear third, the dilated edge evenly curved from front to rear.

C. klagii, Bow.—Inner edge sharply and evenly dilated to a point just back of the middle.

C. perplexa, Jac.—Inner edge feebly dilated at middle and then straight to tip.

C. punctipennis, Bow.—Inner edge evenly dilated to a point behind the middle, the outer edge rather strongly sinuate.

C. gemmingeri, Har.—Inner edge strongly and evenly dilated at middle, outer edge sinuate back of it.

C. confusus, Bow.—Nec *gemmingeri*, Har. Jac., 'Biolog.', vol. vi, pt. i, p. 137; inner edge strongly dilated at posterior third.

Colaspis cribricollis, Lef.

Is described as having wholly fulvous antennæ. In 'Psyche,' vol. xx, p. 125, was published a note on the *phytophaga* of the Stanford expedition to Brazil; specimens from Independencia were referred to this species with a query. The antennæ of the Stanford examples have the seventh and last two articles nearly black and the hind tibia of the ♂ feebly dilated at the posterior third. There is at hand only one example of *cribricollis* ♂, so I am unable at present to definitely establish the Stanford form, but it is very probably distinct.

Jacoby, in 'Biologie,' vol. vi, p. 137, under *Colaspis gemmingeri*, Har., refers to that Brazilian species the Mexican forms, merely stating the former are larger and more narrowed behind; both forms have the hind ♂ tibia dilated within. Von Harold, speaking of his species (the Brazilian), says the tibia dilated at the middle, the Mexican ♂'s have the dilation nearer the apex, therefore I differentiate the latter under the name of *confusus*, Bow. In this connection it may be noted that I have seen no examples of either form from the territory between Honduras and Brazil; I have ten examples from Mexico and fifteen from Brazil.

C. chalcites, Lef., from Peru is described by Lefevre without mentioning any details of the ♂, and my three examples, which apparently came from Lefevre, are all ♀'s. A form occurs in Bolivia which might be this or a closely allied species. The Bolivia ♂ form has a well-marked notch on the inside of the hind tibia at about the beginning of the apical third; until it is compared with a ♂ of *chalcites* I prefer to call them all alike, though they differ somewhat in other details.

Colaspis geminata, Lef.

The four specimens I give this name to are from Rio and Teresopolis, and all are ♀; chestnut brown with æneous colouring; *geminata*, Boh., I identify in a ♂ from Rio, dark bronze colour; it is larger than the foregoing ♀'s, thorax not so heavily punctured and elytra more regularly geminate punctate, and with the hind tibiæ strongly dilated within. For the present I regard the forms as distinct, but if they should prove the same Lefevre's name must sink as a synonym; plenty of specimens from Rio would settle the question.

The types of all the forms hereinafter described are in my collection.

Colaspsis townsendi, sp. nov.

Form and size of *prasina*, Lef. Body above and below entirely dark purple; legs, palpi, labrum and antennæ flavous, the latter with the last five or six joints dark; thorax grossly confluent punctate, elytra grossly punctured, largely in double series, the intervals more or less raised, giving a semicostate appearance as in *prasina*, Lef.; hind tibia of ♂ sinuate or feebly dilated within.

Type, ♂ and ♀, Jicaltepec, Vera Cruz, Mex. (Townsend).

Length, 7-8 mm.

Head densely and coarsely punctate (except the vertex) with smooth calli near the eye, more or less longitudinally impressed on the vertex; thorax unidentate at the side and sinuate just in advance of the angle, so that it might be called subbidentate; scutel and umbone of the elytra smooth, the latter without visible depression, and crowded with gross punctures which are confused in the neighbourhood of the scutel—heretofore classed in collections as *prasina*, Lef., but separable by the sinuation of the ♂ tibia; it is also apparently a more northern form; the ♀ is somewhat larger than the ♂, tibia plain, last ventral segment with heavy punctures and bluntly notched.

Colaspis lebasoides, sp. nov.

Form of a small *prasina*, Lef.; oblong. Metallic green above and below; feet, palpi, labrum and antennæ flavous, the latter somewhat infuscate at tip; head everywhere densely punctate with usual

smooth calli; thorax thickly and coarsely punctured with several smooth areas on the disc; sides subtridentate, elytra everywhere closely and coarsely punctate, forming more or less continuous transverse rugæ; hind tibia of ♂ dilated at posterior third.

Type, ♂ and ♀, Capetillo, Gua. (Champion) (first Jac. Coll.).
Length, 6 mm.

This species was included by Mr. Jacoby in his *lebasi*, Lef., material, and so referred to in the 'Biologia,' but the tibia of the ♂ show it is distinct; the facies is also somewhat different.

The entire front of the head is almost flat; the dentation of the thorax seems to vary, but the middle angle is well marked, the sinuations before and behind (at a certain angle) giving the subtridentate appearance. The general punctuation of the upper surface is much denser, and the form of the body more tapering than in *lebasi*, coming in this respect next *mexicana*, Jac., from Cordova, Mex.

Colaspis flavofasciata, sp. nov.

Very large. Below with legs flavous, above greenish blue with a broad flavous band across the middle of the elytra connected with the lateral margin (narrowly) and apex (broadly) of the same colour; elytra deeply punctate striate, the intervals strongly elevated costate, nine on each side.

Type, 1 ♀, Chancomayo (*ex* Donckier Coll. 14).
Length, 13 mm.

Front transversely depressed below the eyes across the epistome, with a deep fovea between the antennæ; vertex sulcate. Blue colour extending from the rear of the head to the transverse groove, and including the fovea, the coloured area coarsely punctate; epistome smooth, convex, deeply emarginate; antennæ flavous, slender, more than half the length of the body, the last six or seven joints darkened; thorax broader than long, quadrate, margined, sinuate on the sides, all the angles prominent, surface grossly punctate, sparsely so on the disc, leaving irregular smooth places; a large deep fovea on each side behind the middle, scutellum smooth, dark fulvous; elytra parallel, regularly punctate striate, the humeral lateral stria splitting just below the shoulder into two parts continued regularly to the apex.

The form of the thorax is analogous to *chrysis*, Oliv., and *cruentate*, Lef., the sculpture of the elytra to the latter; the largest form in my collection, but seemingly undescribed.

Colaspis concolor, sp. nov.

Large. Light brown, with black eyes and mandibles; joints 6 and 7 of the antennæ more or less fuscous; thorax at sides tridentate; elytra without basal depression narrowing toward the apex, thickly semi-regularly punctate; intervals divided by about nine or ten fairly well-defined costæ, so that the punctures are from two to four rows deep.

Type, ♀, Bartica Dist., Br. Guiana (Coll. 406) kindly presented to me by the New York Zoological Park Bureau of Tropical Research.

Length, 9.5 mm.

Head grossly punctate with a deep frontal fovea; thorax wider than long, grossly confluent punctured, with a few smooth areas on the disc, obsoletely depressed on either side behind the middle; scutellum with one or two large punctures; the elytral area around the scutellum is depressed, and the thick punctuation gives a semi-opaque appearance.

This form is so large and comes from such a comparatively well-worked district that I am rather surprised not to find any description fitting it.

Colaspis goyazensis, sp. nov.

Like *trivialis*, Boh.; oblong. Above and beneath greenish bronze, with apex of elytra paler; legs pale, with knees, apex of tibiæ and tarsi cyanescent; antennæ long and slender, rufous, becoming fuscous after the middle; palpi and labrum rufous, thorax unidentate at about the middle; upper surface thickly punctate, the elytra mostly in double series with smooth, more or less raised longitudinal intervals which become costate at the apex. Hind tibia of ♂ nearly simple, very feebly sinuate.

Type, 4 ♂ and 1 ♀, Mineiro, Goyaz, Brazil.

Length, 5.5–6 mm.

Head closely punctate, moderately longitudinally impressed on the front with the usual smooth calli; thorax thickly coarsely punctate; sides angulate at the middle and sinuate before; the punctuation of the elytra is more or less confused near the scutellum in the ♀. Allied to and resembling *trivialis*, Boh., but easily separated by the very different hind tibia of ♂. The general appearance is bronzy-green with apex of elytra pale.

Colaspis dilatipes, sp. nov.

Like a large *trivialis*, Boh.; elongate. Shining, bronzy brown; legs and antennæ more or less rufous; head finely, thorax coarsely, thickly punctate; sides strongly angulate at middle, ♂ with median smooth line; elytra regularly biseriately punctate, with raised longitudinal smooth intervals, which are costate at the rear; hind tibia of ♂ strongly dilated below the middle, forming a blunt bulge within.

Type, ♂ and ♀, Ceara-Mirim, Rio Grande de Norte, Brazil (W. M. Mann).

Length, 7–7.5 mm.

Head densely punctate, faintly longitudinally sulcate, with prominent smooth calli; antennæ dark, with the bases of the joints light, thorax widely margined and prominently angled at the sides and with a post-median depression on each side (more

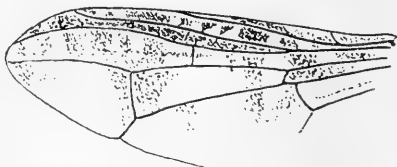
noticeable in ♂); the elytral punctuation is almost entirely regular (even near the scutel), and with the punctures on each interval more or less confluent; in some intervals, especially towards the sides and rear, the intervals are widened and punctures increased; body below nearly black in ♀. Nearly allied to what I call *geminata*, Boh., from Rio, but separable by the hind tibia of the ♂.

(To be continued.) p. 72

AN ORTALID FLY IN BRITISH AMBER.

By T. D. A. COCKERELL.

In the 'Transactions of the Norfolk and Norwich Naturalists' Society,' vol. v, pp. 92-95, Mr. Alfred S. Foord described the insects found in amber washed up on the shore in the vicinity of Yarmouth, Norfolk. A plate was given with numerous figures. Only two species of insects were specifically determined, *Apis*



Scholastes foordi.

mellifera (*mellifica*) and *Blatta orientalis*; the latter determination is incorrect. The specimens are all in the Museum of Geology of Cambridge University, where I examined them years ago. Recently, with the kind permission of Prof. Marr, I have again had them out for examination, and have figured and described one of the species as follows:

Scholastes foordi, n. sp.

Broad, about 9 mm. long, the abdomen turned downward at end. Dusky, testaceous beneath, apparently darker above; vertex dark, but not black, without the pallid transverse stripes of *S. cinctus*, Guér.; apical joint of antennæ whitish; dorsum of thorax bare, but four strong lateral bristles in a longitudinal row anterior to the wings, exactly as in *S. vicarius*, Hend.; the scutellar bristles are also similar, but whether six I cannot determine; abdomen broad and short, as usual in the genus; venation also as in living species, but the second vein not so distinctly elevated or humped about the middle and lower apical corner of discal cell less produced; pattern of wings less pronounced than in the living species, but of the same type (for details see figure).

This is fig. 7 of Foord's plate, which shows the whole fly.

I am much indebted to Mr. C. G. Lamb, Mr. F. W. Edwards

and Mr. Hugh Scott for assistance when studying this fly. As close a comparison as I was able to make showed no important difference from the modern genus *Scholastes*, Lw., 1873. Superficially the fly is perhaps rather more like the species of *Euprosopia*, but the submarginal cell, contracted before the end, agrees better with *Scholastes*. The existing forms of *Scholastes* are smaller. The question has arisen whether these pieces of amber are genuinely British. There are two alternative possibilities :

(1) That the specimens are "faked" for sale. After careful consideration I am sure this must be considered out of the question, as all contain minute insects or spiders, which surely would not have been put in by an artificer.

(2) That the specimens are in copal from Africa, being either imported and sold as native amber, or possibly derived from the wreck of a ship. The material looks very much like copal, but the two honey-bees are too large for the African *Apis unicolor*, Latr., which they should presumably be if in copal. They can only be referred to *A. mellifera*, the black variety with slightly pallid scutellum.

Assuming that the amber is genuinely British, we can say definitely that it is not contemporaneous with the Baltic (Oligocene) amber. All the bees in Baltic amber seen by me belong to extinct genera, and this amber nearly always contains trichomes of the oak, absent from the Yarmouth material. The Ortalid now described is of an Ethiopian or Oriental type, but I cannot identify it with any species in the British Museum. African copal may be Pleistocene or recent, and the older copal probably contains at least some extinct species. The fly, so far as it goes, distinctly suggests that the material may be copal, but it might very well occur in Britain in amber of upper tertiary age, say Pliocene. The question is a very interesting one, and it is to be hoped that further and more definite evidence will be found. Miocene amber is known from other parts of Europe.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

By THOMAS GREER.

(Continued from vol. liii, p. 277.)

NOCTUIDÆ.

Acronyctinæ.

Demas coryli, L.—Locally abundant at Favour Royal (K.), Killymoon and near Lissan ; larvæ on birch and sawallow.

**Acronycta leporina*, L.—A single example in the Lough Neagh district, June, 1920 ; a pale form.

Acronycta megacephala, Fb.—Rare, near Favour Royal (K.).

**Acronycta tridens*, Schiff.—Several bred from larvæ found near Stewartstown.

Acronycta psi, L.—Very abundant.

**Acronycta menyanthidis*, Vw.—Not uncommon; a number bred from larvæ found at Lough Neagh; var. *scotica*, Tutt; a few larvæ on *Myrica gale* at Lough Fea (H.).

Acronycta rumicis, L.—Abundant generally; var. *salicis*, Curt., not uncommon at Favour Royal (K.) and also locally.

Trifinæ.

Agrotis (Euxoa) segetum, Schiff.—Very abundant, less common in the autumn; varying from light brown to almost black.

**Agrotis (E.) vestigialis*, Rott.—Not uncommon at ragwort and heather bloom on the sandy shore at Washing Bay, L. Neagh; this locality is almost thirty miles from the sea, as the crow flies.

**Agrotis (E.) corticia*, Hb.—Rare at light, and at privet blossom.

**Agrotis (E.) cinerea*, Hb.—A single specimen, taken at light at Tullylagan near Cookstown, June, 1897.

**Agrotis (E.) nigricans*, L.—Locally abundant at ragwort at Killymoon; Loch Fea and near Lough Neagh; dark form ab *fumosa*, Haw.

**Agrotis (E.) tritici*, L.—Not uncommon, with var. *aquilina*, God., on sandy ground at Killymoon; rarer near Stewartstown.

Agrotis (Feltia) exclamationis, L.—Very common, varying from pale brown to black.

Agrotis ypsilon, Rott.—Fairly common at sugar and ivy bloom; var. *pallida*, Tutt, occasionally.

Agrotis (Lycophotia) strigula, Thnb.—Abundant on heathery ground; the local form, dark red.

**Agrotis (Peridroma) saucia*, Hb.—Sometimes not rare at sugar and ivy; single examples of ab. *margaritosa*, Haw.

**Agrotis (Eueretagrotis) agathina*, Dup.—Locally abundant in the district on the bogs. The following forms have occurred: *hebridicola*, Staud., *rosea*, Tutt, and *scopariæ*, Mill.

Noctua (Exarnis) augur, Hb.—Abundant and widely spread.

Noctua glareosa, Esp.—Kane states that this species is rare at Favour Royal; not uncommon at heather bloom in this locality and widely distributed.

Noctua baja, Fab.—Generally common at sugar and grasses.

Noctua c-nigrum, L.—Abundant in this district at *Glyceria fluitans*, although Kane states that it is scarce generally in Ireland.

Noctua triangulum, Hufn.—Not common, but widely distributed; Lissan, Lough Fea and at Killymoon.

Noctua brunnea, Fb.—Locally abundant generally in the county; blackish forms near Lough Fea.

Noctua primulae, Esp.—Abundant everywhere at sugar and thistles; Kane records var. *conflua*, H. S., from Tyrone; an example with the square spots on fore-wings connected by a dark line under the orbicular.

Noctua dahlia, Hb.—Locally abundant in the county; Kane took a very dark form var. *perfusca* at Favour Royal, and I have met with the same aberration near Tamnamore, Lough Neagh, some of the males from this locality being almost black.

Noctua rubi, View.—Abundant generally and double brooded.

Noctua umbrosa, Hb.—Common and widely spread, often in swarms at *Glyceria fluitans*, sugar having little or no attraction when this grass is in flower.

Noctua (Segetia) xanthographa, Fb.—Abundant everywhere, varying from a grey to a black form, ab. *nigra*, Tutt.

Noctua (Ochropleura) plecta, L.—Very common.

Axylia putris, L.—Generally common.

Triphaena (Agrotis) orbona, Fb.—Abundant and widely distributed; the var. *rufa*, Tutt., is not rare.

Triphaena (A.) pronuba.—Very abundant.

Triphaena fimbria, L.—Larvæ abundant in the spring on willow and birch, but the imago is seldom seen.

Triphaena ianthina, Esp.—Abundant at heather blossom and ragwort.

Eurois prasina, Fb.—Abundant at Favour Royal and Altadiawan (K.), not uncommon locally in woods.

Aplecta (Mamestra) nebulosa, Hufn.—Rarer than the preceding species; a few near Cookstown (H.).

Barathra brassicae, L.—Kane found this species common everywhere; in this district (E. Tyrone) it is distinctly rare.

Mamestra oleracea, L.—Abundant everywhere; some specimens have only a trace of the reniform stigma.

Mamestra thalassina, Rott.—Abundant at sugar in June; Kane found var. *achatis*, Hb., at Favour Royal.

Mamestra pisi, L.—Locally abundant; var. *splendens*, St., at Favour Royal (K.); also at Lough Fea. Kane records a brown form from the county and also var. *distincta-scotica*, Tutt.

Mamestra glauca, Hb.—Kane took this in abundance on the moorlands at Altadiawan; sometimes common at *Vaccinium myrtillus* growing in gulleys and ravines on the mountains near Lough Fea; 900 to 1000 ft.

Mamestra dentina, Esp.—Common and widely spread.

Dianthæcia conspersa, Esp.—Abundant generally in the county; larvæ on *Lychnis flos-cuculi* and *Selene inflata*; var. *suffusa*, Tutt; occurs near Lough Fea.

Dianthæcia capsicola, Hb.—Less abundant than the last species; larvæ on *S. inflata* only.

Dianthæcia cucubali, Fues.—Abundant at *Lychnis* flowers in damp localities.

**Hecatera serena*, Fb.—Not rare at bladder campion, *S. inflata*, near Grange, also at Lissan and near Stewartstown; some examples with fore wings suffused with grey.

Epineuronia popularis, F.—Males often abundant at light, females at rest on grasses.

Charæas graminis, L.—Abundant generally on moory ground.

Eumichtis (Hadena) adusta, Esp.—Common and widely spread; dark forms at Lough Fea.

**Eumichtis (H.) protea*, Bkh.—A single example at sugar, Curglasson, September, 1916; a second specimen at Stuart Hall, September, 1920.

Luperina testacea, Hb.—Not uncommon at light, var. *negrescens*, Tutt; at Lough Neagh.

**Cerigo matura*, Hufn.—Not rare at sugar and light; at Killymoon, Lissan, and near Stewartstown.

**Celena haworthii*, Curt.—Abundant on moorlands and bogs; not uncommon in a marsh near Stewartstown, where *Eriphorum* is absent; the larva probably feeding on *Carex* or *Glyceria*; the form here is dark and obscurely marked, very different from the moorland type, which is purplish red.

**Hama furva*, Hb.—Rare at ragwort, near Lissan.

Apamea gemina, Hb.—Very abundant at grasses, var. *remissa*, Hübn., not uncommon; and also at Favour Royal (K.).

**Apamea unanimitis*, Tr.—Locally abundant in the district wherever *Phalaris arundinacea* is found in any quantity; Prof. J. W. Harrison took larvæ near Cookstown; the imago is to be taken at dusk, and later, with the aid of a light, flying over or at rest on this grass, and seldom comes to sugar here.

Apamea basilinea, Fb.—Very abundant; the var. *finitima*, Gn., at Favour Royal (K.).

Apamea secalis, L.—Very abundant everywhere, varying from a dirty grey to black in banded and unicolorous forms.

**Apamea ophiogramma*, Esp.—Locally common and widely spread; frequenting *Glyceria*, growing in damp ditches and marshes. Localities: Near Lissan, Grange, at Stewartstown, and in the Lough Neagh district.

Miana strigilis, Clerck.—Abundant at sugar in the following forms: Vars. *latruncula*, Lang., *ærata*, Esp., and *fasciata*, Tutt.

Miana fasciuncula, Haw.—Common generally; var. *suffusa*, Tutt., at Favour Royal (K.).

**Miana literosa*, Haw.—Almost as abundant as *M. strigilis* in this locality, the imago frequenting grasses in the marshes and ragwort on pasture-land.

**Miana bicoloria*, Vill.—Not common; a dull putty-coloured form, var. *terminalis*, Haw.

Xylophasia rurea, Fb.—Very abundant; the greyish-white (type) form not uncommon; var. *combusta*, Haw., are.

Xylophasia lithoxylea, Fb.—Common and widely distributed.

Xylophasia sublustris, Esp.—Very local at Favour Royal (K.).

Xylophasia monoglypha, Hufn.—Abundant everywhere, varying from a pale form to vars. *infuscata*, White, and *ethops*, Tutt; the latter not uncommon at Lough Fea and also near Favour Royal (K.).

Xylophasia hepatica, L.—Kane records this species as very local at Altadiawan and Favour Royal.

**Aporophyla nigra*, Haw.—Rare at sugar, Killymoon.

Miselia oxyacanthæ, L.—Abundant at sugar and ivy bloom; one ab. *capucina*, Mill., near Killymoon; a dark form approaching this at Favour Royal (K.).

Agriopis aprilina, L.—Rare in the county (K.); a single example at sugar near Lissan.

(To be continued.)

NOTES ON THE VARIATION OF *PERONEA CRISTANA*, FAB., WITH DESCRIPTIONS OF SIX NEW FORMS, AND THE REASONS FOR SINKING THE NAMES AT PRESENT IN USE OF SIX OTHERS.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 16.)

Ab. *ulotana*, Clark. After very careful study I am convinced that this aberration is identical with ab. *sericana*, Hüb.

Clark describes this (*loc. cit.*, p. 291), "anterior wings dark slate-colour, with a bright red streak which proceeds from the base to the large button, which is also red"; and of ab. *sericana*, Hüb., he says, "fore wings of a purplish grey, but with a bright orange median longitudinal line from base to beyond the middle of wing, edged above with a darker line running up to apex."

To the "purplish-grey" colour of *sericana* one must give a certain latitude, for, as is well known, Hübner's figures vary a good deal, and in the six copies of his work I have been able to consult, no two give the ground-colour of this figure exactly the same; in one at least it is practically identical with Clark's type of *ulotana*, which, moreover, has the front of the superiors "edged with a darker line running up to the apex," described by Clark as characteristic of *sericana*. By far the most striking character of *ulotana* is the "bright red streak which proceeds from the base to the button," and this is identical in both forms; the name *ulotana*, Clark (1901), should therefore sink in favour of the much older one of *sericana*, Hüb. (1796).

Ab. *nigropunctana*, Clark, comes near to ab. *fulvostriana*, Desvignes. Clark says "it is easy to distinguish it from *albipunctana*, Stephs., and *ochreapunctana*, Clark, because it has an almost black button and the others have light ones," but he does not

allude to the much more difficult task of distinguishing it from *fulvostriana*, Dsvgs., which, as the latter says, is "similar to *striana* except for a fulvous vitta." The type of *nigropunctana* is correctly described by Clark. I should differentiate it from *fulvostriana* by the more uniform-coloured disc of the superiors, this is more ochreous than in *fulvostriana*, which I should call reddish brown; it has also an orange vitta instead of a lighter fulvous one. Clark's ambiguous description has led me into an error in including in the list of captures in my paper (*loc. cit.*, p. 269) six examples of *nigropunctana*; all but one should be *fulvostriana*. I have only one other example of *nigropunctana*, which was taken in the New Forest in 1918. I consider it an extremely rare form. The Webb series is hopelessly mixed: of thirty-four specimens (apart from the type) only eight agree with it, eight are *ab. provittana*, Dsvgs., one is *combustana*, Dup. = *sequana*, Curtis, and the remainder can only be called *fulvostriana*, Dsvgs. Apart from the *fulvostriana* alluded to above, Webb had nineteen examples in one part of his series and ten in another part. His series of sixteen so-called *provittana*, Dsvgs., can, as previously stated, only be designated *fulvostriana* also. Evidently the task of separating these very similar forms was utterly beyond the powers of his eyesight.

There are six series in the Webb Collection that do not agree with any named forms, and as they are all quite distinct and recurrent I propose to give them names.

The first is one of the white forms, which I propose to call *ab. flavana*, n. ab. This was described by Webb, but not named, in his paper (*loc. cit.*, 'Entomologist,' vol. xliii, p. 200) as follows: "Basal half of wings dirty yellow, with a few reddish markings at the base. The red line from the button terminates at the costa before the apex, and is strongly pronounced; it is continued towards the base after having been interrupted by the central white tuft and pale fascia, then along the outer edge of the vitta to the base of the wing. The white clouds in the hinder third of the wings are distinct and well defined, and the ends of the wings are red brown." This description is correct and I have adopted it. In the Webb Collection there are two examples of this form, which is a very handsome one. These, as he says, came from the Clark Collection "as *tolana*, with which they have no affinity." I also have two examples from the New Forest, and Mr. South has one. I believe *ab. flavana* to be purely a New Forest form.

Ab. southiana, n. ab. I give this name after Mr. R. South, who first interested me in *Peronea cristana* and who has done so much for entomology, to a very handsome form, of which there are four specimens in the series, three of which came from Clark; it is alluded to by Webb as wanting a name (*loc. cit.*, vol. xlv, p. 291), and I describe it as follows:

Exactly as *semiustana*, Curtis, but with pure white vitta, button, subsiding tufts, head and thorax. The specimens are all without data, but Webb says: "Several specimens have been taken in the New Forest." Mr. South has an example of this form, which also came from the New Forest.

Ab. *webbiana*, n. ab. This form is similar to the last, with the exception that the vitta, button, subsidiary tufts, head, palpi and thorax are cream-coloured instead of white, and the ground colour of the superiors is darker. There are half a dozen examples in the collection, two from Folkestone (Purdey), one Epping Forest, no doubt from Clark, and three without data. I believe this is not an uncommon aberration at Folkestone, and I have obtained two this year from the New Forest. The form is of course named after Sydney Webb.

Ab. *fulvana*, n. ab. Exactly as *desfontainana*, Fab., but with only a trace of a button. The examples, nine in number, were labelled by Webb ab. *sericana*, Hüb. They are old specimens, set on white pins, without data, except that one is labelled "Sheppard's sale" and another "Bond Collection"; the form is a not uncommon one in old collections, but I do not know of any modern examples, and presume it came from a locality that no longer produces *cristana*.

Ab. *ustulana*, n. ab. This form is the one that at present is usually, but erroneously considered to be ab. *provittana*, Dsvgs. It is exactly as ab. *semiustana*, Curtis, but has a cream-coloured vitta, head, palpi and thorax; it is a well-known and striking form, not uncommon in the New Forest, from which I have a series of fifteen specimens. There were four in the Webb Collection, three of which were labelled "Bond Colln.": the other was unlabelled.

Webb states (*loc. cit.*), vol. xliii, p. 266, "The old students of *cristana* regarded a 'similarly colored' (to *proxanthovittana*, Clark) 'brown tufted insect' as *xanthovittana*, Desvignes.

As the true *xanthovittana*, Desvignes, is without, or has only a small button, it follows that the form quoted by Webb is at present without a name, for clearly he refers to a form with a button of average size; his suggestion (*loc. cit.*) that the name *proxanthovittana*, Clark, should be transferred to it being homonymous is invalid in accordance with the laws governing nomenclature. I therefore give it the name *fulvopunctana*, n. ab., and describe it thus.

Superiors reddish brown, with the bases, costal blotch, and some smaller areas of a slightly darker brown colour, giving the whole wing a somewhat mottled appearance; the button is bright red-brown; the head, palpi and thorax are a dark cream colour with red-brown scales intermixed; the vitta is a rich yellow.

There are sixteen examples in the series; all old specimens, three of which date before 1850. All are without data with the

exception of five, two of which are labelled "Bond Collection"; one "Mason Collection"; one "Webb, New Forest, 1891," and one "Harper Collection"; they were placed by Webb next to his series of *xanthovittana*, Desvignes, and were not named.

I have been repeatedly asked what method I adopt in arranging the forms of *cristana* in the cabinet. There is only one method which I can conceive has anything to recommend it, and that is, in groups. Webb, in his paper (*loc. cit.*), adopts this method, but he does not make any attempt at a natural sequence. My arrangement, which I give for what it is worth, observing that it does not pretend to be perfection, is as follows:

I divide the forms into nine groups, which I call the *cristana*, *chantana*, *spadiceana*, *ruficostana*, *striana*, *profanana*, *desfontainana*, *cristalana*, and *capucina* groups, and arrange them in the following order:

(1) *Cristana* group. Forms with plain unicolorous ground-colour to the superiors, with or without vitta, and button, and including the following aberrations: *Cristana*, Fab., *albipunctana*, Stphs., *ochreapunctana*, Clark, *fuscana*, Clark, *nigrocristana*, Clark, *albonigrana*, Clark, *alboflammana*, Curt., *subalboflammana*, Clark, *fulvopunctana*, Sheldon, *xanthovittana*, Desvignes, *nigropunctana*, Clark, *subrittana*, Stphs., *punctana*, Clark, *nigrosubrittana*, Clark, *unicolorana*, Desvignes, and *subunicolorana*, Clark.

(2) *Chantana* group. Forms with the front half of the superiors from a line drawn from the inner margin of base to near the apex chestnut colour, including abs. *chantana*, Curt., *postchantana*, Webb, *prochantana*, Clark, *subchantana*, Clark, and *vaughaniana*, Webb.

(3) *Spadiceana* group. Forms with the front half of the upper wing from the inner margin of base to near the apex different shades of brown, including abs. *spadiceana*, Haw., *vittana*, Stphs., *intermediana*, Clark, *brunneana*, Stphs., *substriana*, Stphs., and *rufinigrana*, Clark.

(4) *Ruficostana* group. Forms with the front portion of the superiors from the inner margin of the base to a point on the costa near the apex dark brown or black, the other portion of superiors, with the exception of the inner margin, being grey. Button very small or not existing, including abs. *ruficostana*, Curtis, *alboruficostana*, Clark, *attaliana*, Clark, *nigrocostana*, Clark, and *transversana*, Clark.

(5) *Striana* group. Forms with the disc of the superiors plain brown or black, but with lighter markings in the anal angle, and the vitta striated with dark lines including abs. *striana*, Haw., *prostriana*, Clark, *merlana*, Clark, *insulana*, Curt., and *fulvostriana*, Desvignes.

(6) *Profanana* group. Forms with superiors brown or black more or less mottled with darker colour, including abs. *profanana*,

Fab., *provittana*, Dsvgs., *semiustana*, Curt., *semistriana*, Dsvgs., *bentleyana*, Curt., *ustulana*, Sheldon, *southiana*, Sheldon, *webbiana*, Sheldon, *atrana*, Clark, *jansoniana*, Webb, *subnigrana*, Image, *nigrana*, Clark.

(7) *Desfontainana* group. Forms with the front portion of superiors from the inner margin of the base to a point on the costa near the apex reddish-orange (except in ab. *sericana*, and ab. *flammeana*, in which it stops at the button), the ground colour being shades of grey or slate colour, including abs. *desfontainana*, Fab., *fulvana*, Sheldon, *consimiliana*, Stphs., *sericana*, Hüb., *flammeana*, Webb, *alborittana*, Stphs., and *fulvocristana*, Stphs.

(8) *Cristalana* group. Forms with the superiors much variegated with lighter and darker markings, the ground-colour grey or brown, including abs. *cristalana*, Donovan, *procrystalana*, Webb, *subcristalana*, Curtis, *fulvocittana*, Stphs., *subfulvocittana*, Clark, and *combustana*, Dup.

(9) *Capucina* group. Forms with the ground-colour of the superiors almost or quite white, mottled with grey or reddish-grey, and including abs. *capucina*, Johnson, *subcapucina*, Desvignes, *purdeyana*, Webb, *gumpinana*, Johnson, *masoniana*, Clark, *curtisana*, Desvignes, *tolana*, Desvignes, *flavana*, Sheldon, and *ochreana*, Sheldon.

It is very difficult to decide where to place a few of the forms, which have affinities with more than one group. Amongst these are *substriana*, Stphs., *rufinigrana*, Clark, *semistriana*, Dsvgs., and some of the melanic forms.

(To be continued.)

THE OCCURRENCE OF *THEOBALDIA ARCTICA*, EDW., IN ENGLAND.

By HENRY F. CARTER.

In January, 1920 ('Bull. Ent. Res.', x, p. 136), Mr. F. W. Edwards, of the British Museum, described a mosquito of the genus *Theobaldia* under the name *T. arctica*. This species, which was represented by a single male captured at Archangel, much resembled the common European *T. annulata*, Sch., and was almost identical in coloration with *T. alaskäensis*, Lud. (1906), and *T. siberiensis*, Lud. (1920). The last-named species is known from the female only, but the Archangel form apparently differed slightly from *T. alaskäensis* in the structure of the male hypopygium, and on this account and in view of its widely different place of origin it was accorded specific rank. In a later note ('Scottish Naturalist,' May-June, 1920) the same author recorded *T. arctica* as new to the British faunal list, he having received four specimens (1 ♂, 3 ♀) from Dumbarton and Edinburgh. He also stated that he was "now inclined to

regard these names (i.e. *T. alaskäensis*, *T. siberiensis* and *T. arctica*) as indicating, at most, slight local variations of a single species of holoarctic distribution." In the same paper, however, he suggests provisional retention of the name *T. arctica* until males from Alaska and Siberia are available for comparison.

Recently, having occasion to examine a series of preparations of the male hypopygia of *T. annulata* in the collection of the Liverpool School of Tropical Medicine, a specimen labelled "Cheshire 1912" was discovered which differed considerably from the others, but agreed with the characters given by Edwards for *T. arctica*. The male from which this preparation of the hypopygium had been made was then examined, and its coloration found to correspond closely with that described for *T. arctica* and *T. alaskäensis*. Subsequently a search through the *T. annulata* material in the collection revealed the presence of a second male of *T. arctica*; this specimen was labelled "bred from larva, Cheshire, 1912." Unfortunately more exact data regarding these two specimens cannot be given, but it is highly probable that both were reared from larvæ, and that these were present in a mixed sample of mosquito larvæ collected in the Wirral Peninsula and intended for demonstration purposes.

The existence of *T. arctica* so far south as Cheshire is of considerable interest; its unexpected appearance in this county emphasises the need—already indicated by recent discoveries—for more consistent and detailed work in connection with our indigenous mosquitoes.

Liverpool;
October, 1920.

THE HETEROPTERA OF INDO-CHINA.

BY W. L. DISTANT.

(Continued from p. 6.)

NEONIPHE, gen. nov.

Closely allied to *Niphe*, Stål, but differing from that genus by the strongly-spined anterior femora, which are closely serrate beneath with a prominent spine before apex.

Neoniphe armata, sp. n.

Ochraceous, thickly rather finely darkly punctate; pronotum with a series of six impressed dark spots on anterior area; eyes pale dull castaneous; scutellum more darkly punctate on anterior area, the basal margin with pale ochraceous linear spots and the disc with indications of a central pale longitudinal fascia; corium paler on extreme lateral margin and with a narrow sublateral paler line;

membrane pale fuscous; body beneath and legs ochraceous, finely darkly punctate, tibiae more ochraceous and less punctate; rostrum about reaching posterior coxæ, its apex black; antennæ sanguineous second joint very much longer than third, remainder mutilated.

Long, 12 mm.

Tonkin; Hagiang.

Tolumnia latipes.

Pentatoma latipes, Dall, List. Hem. i, p. 238 (1857); var. *contingens*, Walk. Cat. Het. ii, p. 302 (1867).

? *Tolumnia ferruginescens*, Bredd. Wien. Ent. Zeit. xxiii, p. 7 (1904). Luang Prabang.

This species, which I previously placed as a var. of *T. latipes*, Dall., is also probably the *T. ferruginescens*, Bredd.

Hoplistodera tonkinensis, sp. n.

Ochraceous, sometimes distinctly darker in hue on basal areas of pronotum and scutellum; head above somewhat coarsely punctate, the central lobe distinctly prominent; antennæ ochraceous, second and third joints shortest; pronotum coarsely punctate, the lateral angles produced in robust subacute spines, their apices slightly reflexed backwardly, and with a notched tubercle beneath at about half their length; scutellum with about basal half coarsely, sparingly, and the apical half more thickly and finely punctate; corium coarsely and irregularly punctate; body beneath and legs a little more darkly ochraceous; rostrum extending a little beyond posterior coxæ.

Long, $6\frac{1}{2}$ – $7\frac{1}{2}$ mm.; breadth between pronotal angles, 7 – $7\frac{1}{2}$ mm.

Tonkin, Chapa; Haut-Mékong, Tong Lap.

Allied to *H. incisa*, Dist. from British India, but a much narrower species, especially in the breadth between the pronotal angles; the third and fourth joints of the antennæ much shorter, etc.

Hoplistodera scutello-maculata, sp. n.

Head, pronotum and scutellum brownish ochraceous or pale castaneous, anterior area of head more or less mottled with obscure ochraceous, central lobe usually more or less piceous; pronotum coarsely darkly punctate, its anterior area with luteous waved corrugations, and a transverse piceous spot on each side before anterior margin; scutellum with distinct luteous reticulate fasciæ, thus giving the ground-colour a maculate appearance, three luteous spots on basal margin, and the whole surface more or less somewhat finely distinctly punctate; corium more or less coarsely punctate; connexivum dull ochraceous, with pale castaneous segmental maculations; body beneath pale castaneous, the legs stramineous; antennæ pale brownish, the basal areas of the joints much paler in hue, third joint shortest, second and fourth subequal in length, apical joint longest; lateral pronotal angles strongly and robustly produced, their apices somewhat acute.

Long, $6\frac{1}{2}$ –7 mm.; breadth between pronotal angles, $6\frac{1}{2}$ –7 mm.

Luang Prabang; Haut-Mékong, Ban Silah, Tong Lap, Vieng Vai.

Allied to *H. convexa*, Dall., from the Philippines.

SACONTALA, gen. nov.

Head a little longer than broad, obliquely deflected, broadest and truncate at apex, the anterior lateral angles produced, the lateral margins concave; pronotum about twice as broad as long, the lateral angles strongly and broadly produced; scutellum broad, considerably passing apex of corium, which is short; membrane short but broad; posterior femora with a short tooth beneath near apex.

Allied to *Hoplistodera*, but differing by the broad and truncate head, etc.

Sacontala rugulosa, sp. n.

Head black, obliquely deflected, thickly somewhat coarsely punctate, the anterior lateral angles produced outwardly, the lateral margins strongly concave; pronotum, scutellum and corium bronzy brown, coarsely punctate and rugulose, pronotum with a distinct central longitudinal carinate line, the lateral angles broad, strongly transversely and a little forwardly produced, their apices concavely angulate; scutellum about as long as broad at base, the basal area moderately elevated and rugulose, remaining area coarsely punctate, the basal angles black; corium short, considerably shorter than scutellum, coarsely punctate; membrane pale bronzy brown, the venation darker; body beneath imperfectly seen in two carded specimens, but apparently coarsely darkly punctate; legs black, annulated with ochraceous, posterior tibiæ only black at base; antennæ mutilated in the two specimens now before me.

Long, $6\frac{1}{2}$ –7 mm.; breadth between pronotal angles, 6–7 mm.

Tonkin; Chapa.

Stenozygum speciosum.

Strachia speciosum, Dall, List. Hem. i, p. 261 (1851).

Stenozygum speciosum, Dist. Faun. Brit. Ind. Rhynch. Het. i, p. 193, fig. 115 (1902).

Laos, Ventiana; Tonkin.

In nearly all the specimens of this species which I have examined the reddish markings as seen in typical specimens are absent and replaced by luteous coloration.

Agathocles dubius, sp. n.

Dark blackish-castaneous, lateral marginal areas of the corium paler but finely darkly punctate; membrane paler, reflecting the dark abdomen beneath, the veins darker; body beneath black, thickly finely punctate; legs dull dark ochraceous; rostrum reaching the intermediate coxæ; head longer than broad, the lateral lobes longer than the central, somewhat convexly narrowed to apex; first joint of antennæ about reaching apex of head, second a little shorter than third, fourth or fifth, which are subequal in length, apical joint with its basal area paler in hue; eyes somewhat prominently exserted; pronotum punctate and moderately rugulose, the lateral margins narrowly reflexed, the anterior and posterior angles slightly produced; scutellum finely punctate and moderately transversely rugu-

lose; corium somewhat coarsely sparsely punctate; rostrum about reaching the intermediate coxæ; body elongate.

Long, 14 mm.; breadth between pronotal angles, 7 mm.

Luang Prabang, Van Nham.

Prionica tonkinensis, sp. n.

Body above dark chocolate brown, thickly coarsely punctate, and with some small scattered obscure ochraceous spots; antennæ black, first joint not reaching apex of head and reddish ochraceous at its base, second joint about as long as third and fourth joints together; pronotum with the lateral angles moderately robust and anteriorly and somewhat upwardly produced, the whole of the lateral margins (including spines) coarsely serrate; scutellum slightly passing base of membrane, which is bronzy-brown; other structural characters as in generic diagnosis.

Long, 10–11 mm.; breadth between pronotal angles, 10–11 mm.

Tonkin; Chapa.

Allied to *P. nigrescens*, Dist.

Menida laosana, sp. n.

Body above dark ochraceous; head, pronotum and corium somewhat thickly, darkly punctate; antennæ ochraceous, apical joint distinctly darker in coloration; eyes black; pronotum with a sublateral margin of small black punctures, and two transverse waved lines of very dark punctures on anterior area; scutellum paler in hue, more greenish ochraceous, a pale smooth spot in each basal angle and a few minute pale spots on each lateral margin, the apex distinctly paler in hue and sparingly blackly punctate; corium darkly punctate, membrane more pale bronzy in hue, the veins prominently darker in hue; wings imperfectly seen, bronzy green, with the veins distinctly darker in hue; body beneath imperfectly seen in carded type, pale ochraceous, the venation and stigmatal spots darker, and a broad submarginal blackish spot on each side of metasternum.

Long, 8 mm.

Laos; Luang Prabang.

Menida raja, sp. n.

Body above dark shining indigo-blue; head dark ochraceous, finely darkly punctate, a large transverse basal ochraceous spot to scutellum, which is slightly centrally angulate on its posterior margin; membrane pale brownish ochraceous with the venation darker in hue; body beneath imperfectly seen in carded type; antennæ ochraceous, extreme apices of the first, second and third joints darker in hue, remaining joints mutilated; pronotum thickly finely punctate; scutellum thickly, finely, somewhat indistinctly punctate.

Long, 7 mm.

Laos; Xieng Khouang.

Menida vitalisana, sp. n.

Head and anterior area of pronotum shining metallic green, posterior area of pronotum and its narrow anterior and lateral margins

shining ochraceous or reddish ochraceous; scutellum pale ochraceous, sparingly punctate, a large transverse basal spot and a small marginal spot on each side before apex metallic green or pale blackish; corium metallic green or purplish green, thickly finely punctate; membrane greyish white; body beneath and legs ochraceous, somewhat thickly darkly punctate: antennæ black, second joint somewhat short, third, fourth and fifth joints longer and almost subequal in length; connexivum ochraceous with somewhat large metallic-green transverse spots.

Long, 8 mm.

Tonkin; Chapa.

The British Museum Collection also contains a specimen from W. Yunnan collected by Dr. Anderson.

(To be continued.)

NEW FOREST NOTES AND CAPTURES, 1920.

By HUGH P. JONES.

In a season such as this last has been, when for weeks on end all active collecting was stopped by wet weather, it is rather a difficult matter to arrange material collected for this paper, any month-by-month treatment being out of the question. For instance, whilst March was a beautiful month, the heat in woods and enclosures here being that which is generally described as summer-like, bringing out spring Diptera and Lepidoptera much before their time, April's weather was just the contrary, cold winds and continual rain keeping back everything that was not already out and decimating those that were—*e.g.* *Euchloë cardamines*, which from being well on the wing by the beginning of April had almost disappeared by May, only a few stragglers surviving to enjoy the sun that eventually appeared, and continued, with dull intervals, until the end of June.

During this fine period insects were so abundant and forward that most entomologists anticipated a record season; but alas! it was not to last. It started to rain again in July, and kept on raining so heavily and continuously that when the sun shone again in August the woods were practically bare of insect life, a state which continued until about the middle of the month—too late, of course, for anything interesting to survive (although I was pleased to see *Dryas paphia*, var. *valesina*, in sufficient numbers to ensure continuity next season).

Limenitis sibylla, amongst the butterflies, suffered the most, being swept entirely away in some places, the greatest damage being done at Royden, where from being out in the greatest profusion towards the end of June not a single specimen was observed later, even *paphia* barely surviving here.

However, the early appearance of the former may have saved it for this part of the forest, for whilst collecting some full-fed

larvæ during the first week of June I saw a male flying, and a week later this sex was well out—possibly records for early appearances, and generally an omen of what is to follow.

August and September were, on the whole, fine, but insects were too affected by previous wet weather to be abundant, almost everything being a month behind time, so that October really took the place of September, the latter month actually producing freshly-emerged species that would, in the ordinary course, have appeared in July. (See list of Tabanidæ.)

I give here a list of my various captures arranged in their natural order, which, under the circumstances, is the most convenient:

Hymenoptera aculeata: At the risk of being tedious I give these in full, *recent* records being much needed. It is a poor list, several families being entirely omitted through shortage of time and collecting weather, but, I think, better than none at all. Amongst the Bombidæ are some rather unaccountable blanks, certainly not due in their case to lack of observation.

Ants: I have done little with regard to naming these at present, not having sufficient types for a sure identification. *Formica rufa* was unpleasantly abundant at Rhinefield in May, beating the oaks bringing down hundreds at a time into the tray, the few lepidopterous larvæ that fell being at once seized upon. A pity the work of destruction was not done earlier to avoid extreme defoliation of the trees, but possibly even the ants in some years are outnumbered by the larvæ of such moths as *H. defoliaria*, *Tortrix viridana*, etc.! Larvæ of a species of *Microdon* (Diptera) were rather common in the nest of *Lasius* sp. ? (*fuliginosus*, without much doubt) at Aldridge Hill in July and August.

Mutilla: Neither *M. europæa* or *M. rufipes* were seen. Absence of the former scarce thing was perhaps to be expected, but I hoped to turn up the latter. Probably both occur.

Pompilus plumbeus was not uncommon at Milford, and *P. viaticus* very abundant on banks by the side of enclosures, etc., but other members of the family were scarce. *P. niger* was taken here and there from May to September, as also *P. gibbus* and *P. pectinipes*. I could not find *P. wæsmali*.

Salix fuscus (scarce at Setley), *S. exaltata*, *S. parvulus*, *Cerophales maculata* (Royden), *Astatus boops* (a few in a gravel-pit at Setley), *Tachytes pectinipes*.

Trypoxylon: All the three species. *Ammophila sabulosa*: Extremely abundant from June to September. A ♂ taken at Park Hill in June measures only 10 mm. across wings! *A. campestris*: Common locally, and evidently in some places outnumbers *sabulosa*, as in several dozen "sand wasps" collected for me all but two were this species. It is, of course, easily identified by the petiolated second submarginal cell and strigose

propodeum, but is markedly distinct in other ways, the ♂ having the abdomen almost black or deep plum-colour--an exaggeration of the black discal spot so characteristic of ♂ *sabulosa*. Also both sexes are of the same size, neither being so large as the average ♀ *sabulosa*, nor so small as some of the latter's males. For the last reason *campestris* can generally be distinguished on the wing.

Psammophila hirsuta: This fine thing did not appear this year until both of the former were almost over, *i. e.* towards the middle of September. Locally common. My last capture was made in the first week of October, and several females were seen later at Setley.

Psammophila lutaria was not seen on the coast here at the end of August, but might have been taken afterwards.

Pemphredon: Members of this family were scarce, and as most of the trunks and palings in the forest were sodden with rain I did not take a single *P. lugubris* or black *crabro*.

Diodontus: Once seen; probably *tristis*.

Mimesa: Only two specimens, which are probably *bicolor*. They were picked out from mixed wasps collected for me and pinned before determination, so that markings on *mesonotum* are difficult to make out.

Gorytes mystaceus (Royden) and *Hoplisis laticinctus* (Royden): A fine ♀ of the latter in July flying over a tangled mass of brambles, heather, etc. Wet weather spoiled the search for this species and *Nysson*, of which family none were seen.

Mellinus arcensis: Extremely abundant locally. At Setley it occurs in one gravel-pit commonly, but not once seen in another close by! Preys here on various *Tachinidæ* (Diptera); on several occasions taken with the bright green *Pseudopyrellia cornecina*. Females are very fond of resting on leaves, especially bracken, probably in search of flies.

M. sabulosus I did not see on the coast here between Milford and Highcliffe.

Cerceris ornata occurred singly at places widely apart. *C. labiata* and *C. interruptus* both taken, but the fine *C. arenaria* not even seen.

Oxybelus uniglumis: Setley and elsewhere, but not common.

Crabro: As referred to under *Pemphredon*, I did not take any of the "black" species. *C. quadrimaculata* was not seen on any dead trunks, old posts, etc. The same may be said of *C. dimidiatus*, although both no doubt were present.

C. cephalotes, *C. chrysostomus* (Royden in September); a single ♀ *C. cribrarius* from G. Gulliver; *C. peltarius* (females not uncommon on banks at Norley Wood and singly elsewhere).

C. lituratus: One ♂ at Royden. *C. albilabris* did not appear.

Vespa: *V. crabro* not nearly so common as last year, and entirely absent at Royden, where the previous autumn it swarmed

at "sugar patches." *V. vulgaris* and *V. germanica* both at Lymington, but *V. rufa* is the wasp of the forest, whether heaths, gardens or woods. *V. sylvestris* and *V. norvegica* were both taken at Royden ("workers" only), but not seen elsewhere. Neither species can be overlooked.

Odynerus: Although continually working at this family I experienced very poor results. *O. spinipes* was fairly common on most banks in most woods, and when not seen its absence was probably owing to the "wood ant," but *O. melanocephalus* was not taken. The latter is more a hedge species. *O. callosus*, *O. parietum* and a few *O. trifasciatus*. *O. pictus* was not seen, and probably deserves the "not common" of Saunders. I have taken both this species and the preceding commonly in Cambridge gardens. *O. parietinus*: A single ♀ brought to me in September. *O. crassicornis*: A female of this scarce species was taken in July during a short break in the rain flying round some bushes. Being almost certain of its identity directly I had it in my hand I tried hard for more, but wet weather set in again, so had no chance. Of its congeners only a solitary *O. sinuatus* was taken, but probably *gracilis* also occurs. The two common species, *O. callosus* and *O. parietum*, were brought to me in numbers throughout August and September on the chance that there might be some rarer species amongst them. Unfortunately this was not so!

Eumenes coartata: Not uncommon during September on heaths at Setley, but I could not find any "nests."

Bees: *Colletes succinctus*, *C. fodiens*, and *C. daviesana*, *Sphecodes gibbus*, *S. subquadratus* and doubtful females.

Halicti: These little bees were unusually scarce. Out of those taken I have determined the following: *H. rubicundus*, *quadrinotus*, *prasinus*, *cylindricus* (I don't think any of these are *albipes*), *villosulus*, *nitidusculus*, *minutissimus* (a few at Norley Wood) and *morio*. *Leucopus* not found amongst few "green" ones taken. I was disappointed at not taking *H. xanthopus*.

Andrena: *A. albicans*, *florea*, *thoracica*, *fuscipes*, *fulvicus*, *argentata*, *afzeliella* and *minutula*. A very poor lot, owing to the fact that I did no spring collecting for them. The beautiful *Dasypoda hirtipes* was not seen on the coast.

Panurgus calcaratus: Two from Mr. G. Gulliver; exact locality in forest uncertain.

Nomada: *N. solidaginis* was in the greatest abundance on all heaths. Whatever the host of this "cuckoo" I pity it! A few *N. roberjeotiana* were found at Setthorns, and other species taken were *N. sexfasciata*, *alternata*, *jacobææ* and *lathburiana*. With the exception of a solitary *N. furva* no others of the family were seen and I could not work for them in the spring.

Epeolus rufipes: Not uncommon where *colletes* was burrowing.

A few *Cœloxys (rufescens, elongata)* and *Megachile circumcincta*,

and *centuncularis*, *willughbiella* and *ligniseca* (the last from thistle-heads at Royden).

(To be continued.)

NOTES AND OBSERVATIONS.

DISAPPEARANCE OF AGRIADES CORYDON AB. SYNGRAPHA FROM THE CHILTERNs.—I have read Mr. Oliver's note on the disappearance of this beautiful form from its once favoured haunts in the hills about Cadssdene. I do not agree with the reasons he suggests for this disappearance, and I believe it myself to be due principally to the depredations of the reckless and callous collector. If not, all I can say is that the coincidence of this year's scarcity, if not actual extinction of the form, is more than remarkable. I have known the Cadssdene locality for close on five and twenty years. I have no doubt that I should have discovered the presence of ab. *syngrapha* (I can find no warrant at present for displacing Keferstein's name as demanded by Tutt, and the substitution of *tithonus*, Meig., as Meigen's description is not convincing) long before I did had I not almost invariably until 1913, I think, been abroad or out of reach of the Chilterns in August. I certainly did discover the form here—at all events, I was the first to publish it, though I left the immediate locality unspecified. Very bitterly do I regret that I ever did publish the second note when I had had an opportunity of visiting the spot at the right season. No one seems to have taken any notice of the original announcement ('Entom.,' vol. xlv, p. 290), probably because it recorded a single specimen, and that late in the year—September 9th. It was in 1916 that I encountered the first net on the *syngrapha* ground. Owing to the war work in which I was engaged I had little time for observations, and my visits had been very few and far between. The net in question had secured twenty examples without effort in a single morning; and, as I anticipated, it was futile to expect that the little preserve, from which I had taken as many examples myself in as many years, would be secret to myself and a few genuine Nature-lovers much longer. My worst fears were realised in 1917, when the ground was overrun by dealers' collectors, and amateurs apparently drawn from all parts of the United Kingdom, and not engaged, I assume, in war work. I have reason to know that some hundreds of *syngrapha* were removed, in the majority of cases immediately on emergence, and, therefore, before they had been given the chance to pair and lay their eggs. Also the worst features of the Royston massacres were reproduced—the variety hunter netting every female, bottling them wholesale before examination, and leaving those rejected as normal dead or poisoned on the grass. The Royston ground is extended, the Chilterns ground but a patch. *Syngrapha* had become a commercial asset. It was, in my opinion, only a question of time how soon the place thereof would know it no more in sufficient numbers to make it worth while the annual invasion. I find the following entry in my entomological notes for 1917: "August 11th. Was disgusted to find people had been on the *syngrapha* ground apparently for a living. . . . Was informed that one collector had taken over 100 the previous day."

I saw but a ragged remnant, which no doubt fell victim to the next destroyer. Being on leave I revisited the scene on September 7th. Again I quote my diary: "A few still fresh female *corydon* about and very *passés* males. As the sun never broke out there was little flying, but curiously enough the one butterfly captured was *syngrapha*—a good example." Search of the grass bents revealed no more; but it is at least reasonable to argue that the form might have been over altogether at this date. We now come to 1918. I was away for the first half of August, and between July 30th and September 7th I found no opportunity to return to the Chilterns. On the former date I find from my diary: "I saw one *syngrapha* only; the species is not yet out in force, but I noted one gentleman already on the ground with a net the size of a coal-sack—big enough to intern the entire butterfly population of the Bucks Chilterns *per se*." On September 7th the slopes reminded me of a visit paid in 1907 to the famous *Plebeius zephyrus lycidas* ground below Berisal. Everywhere the grass, flowers, and down had the appearance of being manœuvred over by a cavalry brigade. "I was surprised to find two absolutely fresh males. No trace of *syngrapha* . . ." The *débauche* had been thorough—how thorough the experience of 1919 was to prove with lamentable conviction. With a view to determining the extent of collection in this locality I attended the meetings of the South London Society in November. The exhibits as usual on this popular occasion were many and various, but it was pitiful to see the cases crammed with the unfortunate *Corydon* "from the Bucks Chilterns"—some hundreds, and many of them typical or of such trivial departure from type that one wondered what they were doing in this gallery. I was not in the least surprised, therefore, when I read the report of the "Variety Exhibition" in the Society's "Proceedings," 1919-20, to find that, though exhibits included "many other interesting forms" from the Chiltern Hills, ab. *syngrapha* was not recorded among them. An extract from my diary reads: "August 15th. Back to Chilterns, but found the drought had accelerated everything, and all butterflies *passés*. The *syngrapha* ground trodden down. I watched two men with huge nets who never moved off the slope all day"—that is to say when I returned from a further investigation on the hills elsewhere, the same nets were still where I left them two or three hours earlier. Their *syngrapha* bag must have been meagre, for I noted ('Proc. S. London Soc.,' 1919-20), at the meeting held August 25th Mr. Newman reported "that *Agriades coridon*, on its usual habitat on the Chiltern Hills, was this year practically extinct, and that although collectors in abundance had frequented the locality in recent seasons, he did not consider the scarcity was due to over-collecting. In his opinion this was due to the attacks of ichneumons, for out of a large number of larvæ of *A. coridon* collected in the spring more than 90 per cent. were attacked." Mr. Newman's conclusions were apparently based on his experiences, or that of his collectors on the *syngrapha* ground only. I agree neither with them, nor the reason he advances for the scarcity of the species. The same day (August 25th), in the course of my rambles not a mile from "the devastated area," I note "a lovely congeries of *corydon* males

over some droppings reminiscent of the alpine throngs," and further, on September 7th, when it may be assumed "the abundance of collectors" had decreased in volume, and the late emergences allowed some respite, despite the unfavourable weather a certain number of males and females—all typical—were observed in the same locality. It may be perfectly true that 90 per cent. of the larvæ collected hereabouts (?) were ichneumonid, but it will take much stronger evidence than that offered by Mr. Newman to convince me that the extinction of *syngrapha* was due to parasitic agency alone. Had not the hundreds of unimpregnated females been destroyed in the seasons immediately preceding 1919, it is reasonable to suppose that the balance of Nature would have been maintained. Mr. Newman says that his experience at Royston was much the same as in this part of the Chilterns. But whereas this year (1920) there appears to have been no such wholesale falling off in that locality, my experience of the *syngrapha* ground is in effect exactly the opposite. If left to itself—and I fear this is too much to expect—it may be that a few *syngrapha* have evaded the net, professional and amateur, and will in time revivify the race. I am assured that a tendency to maleness in a local form, provided the type is allowed to exist, cannot be altogether eradicated by the extermination of the local form in question. May it be so, but for the present it is quite clear that indiscriminate collection threatens to destroy, if it has not actually killed, the goose that lays the golden egg. I have written these notes, therefore, to urge upon dealers and amateurs alike, not merely the unwisdom of their attacks, but in the hope—perhaps that is rather too sanguine a word—that *A. corydon syngrapha* in this little angle of its distribution may be left alone for a few years, if it be ordained to work out its own salvation. As it is, it seems to have suffered "the common fate of all things rare," and to have realised prematurely, and to the grief of all true lovers of nature.

"How small a part of time they share
That are so wondrous sweet and fair!"—

H. ROWLAND-BROWN; Harrow-Weald, December, 1920.

BUTTERFLIES IN SOUTH BUCKS, 1920.—The following short notes on butterflies observed in South Bucks this season may be of interest: *Euchloë cardamines*: Not nearly so abundant as usual. *Colias edusa*: Abundant on the Chilterns. *Gonepteryx rhamni*: Not so abundant as usual in the summer, but abundant in the spring. *Limnitis sibylla*: Though I captured one specimen in 1919 I was unable to re-discover this butterfly this year. *Eugonia polychloros*: I have never met this butterfly here, with the exception of one doubtful specimen flying high. I should be glad to know if other readers have encountered it in S. Bucks. *Aglais urticae*: Abundant. *Vanessa io*, *Pyrameis atalanta*: Both very abundant. *P. cardui*: A few seen. *Dryas paphia*: Not abundant. *Argynnis cydippe*: Abundant. *A. aglaia*: Very abundant and variable. *Brenthis euphrosyne*: Abundant. *B. selene* I have never met with. *Melitæa aurinia*: One specimen near Risboro'. *Melanargia galatea*: Very abundant on the Chilterns. *Pararge egerides* and *P. megæra*: Very abundant. *Epinephele tithonus*: Not nearly so abundant as usual. *Aphantopus*

hyperanthus : Abundant and very variable. *Cænonympha pamphilus* : Abundant and variable. *Zephyrus betulae* : One only seen but not captured. *Z. quercus* : Extraordinarily abundant, but elusive. *Callophrys rubi* : Very abundant on the Chilterns. *Chrysophanus phleas* : Not so abundant this year. *Aricia medon* : Abundant everywhere. *Agriades corydon* : Very abundant; no extreme variations observed, the commonest blue. *Celastrina argiolus* : Not so abundant as usual. *Cupido minimus* : Abundant on the Chilterns. *Nemeobius lucina* : Very abundant on the Chilterns. *Hesperia malvae*, *Nisoniades tages*, *Adopæa flava*, *Agriades sylvanus* : All everywhere abundant. *A. comma* : Not so abundant as usual.—WALTER PIERCE; High Wycombe, Bucks.

BUTTERFLIES OF VENTNOR, 1920.—The following is a list of butterflies, all actually netted, not merely seen, within a three-mile circuit of Ventnor, Isle of Wight. Abundant : *P. rapæ*, *P. atalanta*, *M. cinxia*, *M. galatea*, *P. megæra*, *E. jurtina*, *E. tithonus*, *C. pamphilus*, *C. rubi*, *A. corydon*, *A. bellargus*. Common ; *P. brassicæ*, *P. napi*, *E. cardamines*, *C. edusa*, *A. urticae*, *V. io*, *P. cardui*, *A. aglaia*, *H. semele*, *Z. quercus*, *C. phleas*, *P. icarus*, *A. medon*, *C. minimus*, *H. malvae*, *N. tages*, *A. flava*, *A. sylvanus*. Scarce : *G. rhamni*, *L. sibylla*, *E. polychloros*, *D. paphia*, *A. cydippe*, *B. euphrosyne*, *P. egerides*, *A. hyperanthus*, *P. argus* (*eyon*), *C. argiolus*. The season was a very bad one, so that the list, which includes thirty-nine species, flatters it immensely. Day after day passed without a glimpse of the sun. On the few really favourable days insects certainly swarmed on the downs and by the coast, but for some remarkable reason seemed to shun private gardens. *Melitæa cinxia* larvæ were out of winter quarters and feeding at the end of January, and thanks to a mild February had all pupated by end of April. This insect is certainly gaining ground inland: I found larvæ quite commonly near Wroxall, two miles from the sea. *Colias edusa* was scarce in spring, but common in August. Four var. *helice* were taken and one or two more missed. One sad event takes a great deal of erasing from the memory. This was a chase after *C. hyale*, and in the long, stern chase to a barbed wire gate separating us from a lucerne field *hyale* beat the net by about 6 inches. There would have been a different ending twenty-five years ago! I have not included *hyale* in my list, as although certain as to its identity myself some may consider I mistook *helice* for it. By far the best thing taken was *E. tithonus* ab. *albida*, as previously recorded (*antea*, p. 210). Many interesting notes were made, but to mention them here would occupy too much space.—ERNEST CORNELL; "Burmah," Newport Road, Ventnor.

HELIOTHIS PELTIGERA AND PHRYXUS LIVORNICA AT VENTNOR.—An entomological friend of mine, Mr. C. J. Pollard, was fortunate enough to take a pair of *H. peltigera* on May 17th flying at dusk over a wallflower bed at Ventnor. Mr. Pollard was also lucky enough to find a dead specimen of *D. livornica* in a doorway on July 13th. It was minus both antennæ, but otherwise in fair condition.—ERNEST CORNELL; "Burmah," Newport Road, Ventnor.

ON SCOPARIA ULMELLA.—In my 'Handbook' I treated *ulmella*

as a form of *ambigualis*, and it is also so treated in Staudinger's catalogue. Mr. J. C. Hayward has been good enough to send me for inspection his series of 14 specimens of *ulmella*, taken on trunks of wych-elm at Repton, where he finds it very local; it appears in July after *ambigualis* is over. This excellent material has enabled me to ascertain that *ulmella* is without doubt a good species. The character most easily apprehended is in the two posterior cloudy white lines (second and subterminal) of the fore wings, which in *ulmella* are confluent or close together throughout, whilst in *ambigualis* they are separated by considerable spaces of ground-colour towards costa and below middle. Additional distinctions of *ulmella* are the rather smaller size, the more strongly and evenly curved first line, the different form of the second line (which in *ambigualis* makes a characteristic angle above middle, whilst in *ulmella* it is evenly rounded at this point), and the more whitish (less grey) hind wings. Fortified with this knowledge I was able to detect a specimen of *ulmella* in my series of *ambigualis*, taken by myself at Ramsbury on July 10th, 1887, whereas my latest date for *ambigualis* is July 2nd. The insect will therefore probably be found widely distributed but local. I hope that Mr. Hayward will now shortly discover the larva.—EDWARD MEYRICK; Thornhanger, Marlborough, January 5th, 1921.

NOTE ON BRETON EPINEPHELE JURTINA.—I find that in my paper on "August Butterflies at Lannion" ('Entom.' vol. liii, p. 277) I omitted to record an ab. of *E. jurtina*, ♀, which approached the South European form *hispulla*. The fore wings with the exception of the outer margin were completely fulvous, the bases being tinged with brownish; there was also a distinct fulvous band on the hind wings. I took the insect at Trestrignel, August 6th, 1920. *E. jurtina* ab. *tinctoria*, Blackie, is practically speaking synonymous with ab. *alba*, Blackie. I therefore wish to sink the former name.—JOHN E. H. BLACKIE; The Vicarage, Windsor.

LAMPROPTERYX (CIDARIA) OTREGIATA IN SOUTH DEVONSHIRE.—I think I ought to record the capture of *Cidaria otregiata*, second brood, which has been kindly identified for me by the Rev. J. W. Metcalf, in a locality near Dawlish in South Devon, in August, 1920.—A. R. HAYWARD; Mount Radford, Misterton, S.O., Somerset.

MELANIC EUPITHECIA LARICIATA FROM CHESHIRE.—Last May I bred a short series of *E. lariciata* from larvæ I had beaten in 1919 from a small fir wood in which there are a few larches. Three of them were pure melanic specimens similar to those occurring at Sutton Coldfield. Last August I again beat a few larvæ (they are far from common), and hope to breed the melanic form again this year. The wood is about half a mile from Alderley Edge.—B. H. CRABTREE; Holly Bank, Alderley Edge, Cheshire, January 3rd, 1920.

ABRAXAS GROSSULARIATA, SECOND BROOD.—I took a ♂ flying in a thick fog at Barnes on the morning of October 21st, and saw another at the same place on October 28th. On the latter morning at Putney I found larvæ in all stages, hibernating to full-fed.—H. WORSLEY WOOD; 31, Agate Road, Hammersmith, W.

XANTHORHOE SOCIATA IN NOVEMBER.—A ♀ taken drying her wings at Putney on the morning of November 28th last.—H. WORSLEY WOOD.

IODIS LACTEARIA LARVÆ HIBERNATING.—About a dozen larvæ beaten from oak on Wimbledon Common on September 15th continued feeding for about a week until nearly full-fed, since when they have refused all food, and though lively if disturbed have evidently settled down for hibernation. Has this tendency been noted before?—H. WORSLEY WOOD.

SIREX GIGAS IN A CLYDE SHIPBUILDING YARD.—*Sirex gigas*, the Giant Wood Wasp, is well known to entomologists as a wood importer. We find this species of Siricidæ in a variety of situations. Gillanders in his 'Forest Entomology' tells us that the best consignment of *S. gigas* he ever received was sent to him by a miner, who found the insects issuing from the pit-props. Carpenters not infrequently find the Wood Wasp when sawing the coniferous trees. The life-history of *S. gigas* is most interesting indeed. Dr. Sharp says that large numbers of these insects emerged from wood, which had been imported from Canada, in a house twenty years after the house had been built. There are numerous other records. In a large shipbuilding yard on the Clyde *S. gigas* aroused great interest. During the last week of July and in the first week of August they emerged from their pupæ in the high "uprights" by which the scaffolding is held, and were found clinging to the bark. All the specimens I reserved from these coniferous, usually larch or pine, "uprights" were in perfect condition; I have a ♀ as small as 1·5 in., and another almost 2 in. long from tip of head to end of the long, thin ovipositor. The ♂'s were all alive when I got them and were in excellent condition. The ♀'s especially aroused great interest, and the glistening bands of black and yellow, the long filiform antennæ, the wide, clear wings and the slender ovipositor all combine to make *S. gigas* seem, at least to the uninitiated, to resemble the hornet. The ovipositor was popularly supposed to be a sting. It is probable that these "uprights" were imported from the great pine forests of northern Europe, where *S. gigas* is a veritable pest. As far as I could ascertain no *S. juvenus* were found.—ALEXANDER CUTHBERTSON; Hazelbank, Yoker, Dumbartonshire, November 10th, 1920.

VESPA IN 1920.—In the November 'Entomologist' Mr. C. Nicholson draws attention to the scarcity of wasps in the south of England this summer. Now I have found the reverse to be the case in Western Argyll. In this locality wasps were very plentiful in September, and I noticed them particularly at Ballachulish, Kilmelfort, Crinan and Tarbert (Loch Fyne). At Crinan the wasps were so troublesome that the visitors at the hotel searched out some nests and destroyed them.—A. STEVEN CORBET; 32, Hamilton Road, Reading.

VESPA IN 1920.—In reply to Mr. Nicholson's query, wasps were unusually abundant in this neighbourhood during September. Several hundreds entered one of my hives in a single hour, and a good many weakened stocks of bees were destroyed by them. On the other

hand, I saw hardly any wasps at all on the Norfolk Broads this year. They were becoming abundant on sugar near Brockenhurst as early as July 2nd.—C. MELLOWS; Bishop's Stortford College, Herts.

SCARCITY OF *VESPA*.—On p. 264 of last volume I mentioned a strong nest of *V. germanica*, and it may interest readers to know that I took that nest on October 24th last. It was in the clay bank of a small pond in a rather frequented place near here, and I had kept it under observation for some weeks waiting for a favourable opportunity. I chose a Sunday morning, and sallied forth just after 7.30 in order to avoid publicity as far as possible. In this I was successful, for the morning was a little misty and very sharp, there being thick hoar-frost on the grass and foliage. On arriving at the pond I was much surprised to find about a dozen workers clinging to the bank immediately round the entrance hole to the nest cavity in spite of the sharp frost, most of them looking numbed with the cold, but seven at least were vibrating their wings and crawling slowly about as if to get up their circulation! On my touching a small nodule of clay which partly blocked the entrance three other workers rushed smartly out and at once attacked me, but fortunately they struck my coat and did no harm. I at once injected a little cyanide, stopped the hole with a rag, and strolled round a bit to keep my own circulation going. On returning in about ten minutes I at once proceeded to remove the front of the bank and found the nest just inside, a thickness of 2 in. of clay only intervening between it and the outer world. I was struck with the few wasps visible inside, and the warmth of the nest cavity was very noticeable when I inserted my hands to lift out the nest, which was as large as a Rugby football. The bottom of the cavity consisted of large pebbles mixed with the usual wet mass of greyish mud and dipterous larvæ, but as the latter seemed to comprise only *Volucella pellucens* and some small "musoids" I did not waste time over them. On reaching home the nest was installed in a box and covered with a sheet of glass and some perforated zinc, giving forth in the course of the next week or so some hundreds of queens, drones and workers.—C. NICHOLSON; Dale End, Chingford.

SOCIETIES.

SOUTHAMPTON AND DISTRICT ENTOMOLOGICAL SOCIETY.—Meeting held Tuesday, September 21st, 1920, at 47, Tennyson Road, Southampton. This was the first meeting held by the Society. Mr. W. Fassnidge, M.A., having just arrived back from France after seven weeks spent in studying the Lepidoptera of that country, gave a very interesting lecture on his experiences. He illustrated his lecture by means of specimens he had collected, chiefly around Dijon, including living larvæ of *P. machaon* and *P. podalirius*.—Mr. F. J. Killington exhibited a remarkable series of the beetle *Elater sanguinolentus*, including one with the red replaced by yellow, and a series, showing great variation, of *Strangalia armata*; also the larva of *Nisoniades (Thanaos) tages* hibernating in a box.

October 5th, 1920.—Mr. F. J. Killington gave a paper on the Odonata of the district and exhibited a large number of preserved

specimens by way of illustration. Mr. W. Fassnidge read a paper on the larval habits of *Limenitis sibylla*, and exhibited the larva in its hibernaculum, the preserved pupa (*in situ*), and a series of imagines. It has been his experience that the larvæ are found on the poorest plants of honeysuckle and always those against some substantial support such as an oak tree. The same gentleman read notes on the larval habits of *Pyrameis cardui*, a species that has been unusually abundant in the district this year.—Mr. B. Hobby, the dragonflies *Ischnura elegans* (orange form) and *Calopteryx splendens*, both taken in Paris this year.—Mr. E. Hayward exhibited a nice collection of "Click" beetles, and presented a number of species to the Society.

October 19th, 1920.—Mr. W. Fassnidge, M.A., gave a paper, the first of a series, on the classification of the Lepidoptera. He dealt thoroughly and lucidly with the different systems, and showed how each served a useful purpose. A paper of this nature naturally led to much interesting discussion at its close.—A paper by Mr. E. Hayward followed, also the first of a series, and dealt with the study of the Coleoptera. A great feature of this paper was the exhibition of a number of ingenious pieces of apparatus devised and made by the lecturer. An exhibition of beetles concluded the lecture. The species shown were: *C. polita*, *C. aureolus*, *P. alneti*, *A. coryli*, *A. curculionoides*, *N. melanura*, *B. glandium*, *B. tessellatus*, *O. tenebricosus*, *O. picipes*, *O. coryli*. A small collection of beetles was presented by the lecturer to the Society.

November 16th, 1920.—Mr. J. E. Eastwood, of Havant, and Mr. G. W. Pierce, of Ouslebury, Winchester, were elected members.—Mr. W. Fassnidge continued his paper on the Lepidoptera, this time dealing with the egg. Discussing first the question of parthenogenesis, he explained that while many records of this phenomenon were undoubtedly due to faulty observation, yet it was a fact that certain Lepidoptera laid ova, without previous sexual union, that produced larvæ and later imagines, and among other examples mentioned *B. mori*. In southern France, where the silkworm is bred, and the stock degenerates from time to time owing to inbreeding, re-invigoration is brought about by this means. The various types of eggs, their structure, the parasitical Hymenoptera that attack them, copulation and fertilisation were all exhaustively dealt with. Photographs and actual specimens of eggs illustrated a very interesting paper.—Mr. E. Hayward also gave the second part of his paper on the Coleoptera, and this time took the sub-order Adephaga as his subject. An exhibition of various species by the lecturer at the end of his paper concluded a most interesting evening.—FREDK. J. KILLINGTON, *Hon. Sec.*, 68, Archer's Road, Eastleigh.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt St., Liverpool, October 18th, 1920.—Mr. S. P. Doudney, President, in the Chair.—This being the opening meeting of the session, it was devoted to an exhibition of the season's work.—Mr. S. P. Doudney showed—*Papilio machaon*, *Nonagria arundinis*, *Arsilonche albovenosa*, *Senta maritima*, *Acontia luctuosa*, and *Bankia argentula* from Wicken. *Macaria notata*, *Eupithecia plumbeolata*, *Lobophora halterata* and *Melanippe hastata* from

Burnt Wood. *Argynnis cydippe* from Arnside. *Plebius ægon*, *Cænonympha tiphon* and *Carsia paludata* from Holker.—Mr. W. A. Tyerman brought Lepidoptera from Tan-y-Bwlch, North Wales, including *Brenthis selene*, *Ino statices*, *Emmelesia adæquata* and *Acidalia subsericeata* and a fine bred series of *Tephrosia biundularia* var. *delamerensis* from Llangollen.—Mr. R. Tait had spent his holiday at Wicken and exhibited from that locality nice series of the following: *Leucania pudorina* and *L. straminea*, *Agrotis obscura*, *Calymnia affinis*, *Epunda viminalis*, *Aplecta advena*, *Lithosia griseola*, *Acidalia emarginata*, also specimens of *Cymatophora octogesima* and *Arsilonche albovenosa*.—The Rev. F. M. B. Carr had a specimen of *Hespera malvæ* from Delamere, this being a new record for Lancashire and Cheshire, also a specimen of *Argynnis cydippe*, a species which had not been recorded for Cheshire for many years, although common in North Lancashire. Other interesting species in Mr. Carr's exhibit were: *Xanthia gilvago*, Chester; Some very dark *Oporabia dilutata*, Alvanley, and fine varied series of *Noctua glareosa* and *Himera pennaria* from Delamere Forest.—Mr. S. Gordon Smith showed long and varied series of the following: *Dryas paphia* from the New Forest, including var. *valesina* and aberrations of the male with the terminal black spots wedge-shaped; *Melanargia galatea* from Market Risborough; several nice aberrations of *Aglais urticae*, bred from Prestatyn larvæ; from Delamere, two fine aberrations of *Cymatophora flavicornis*, a fine varied series of *Nyssia hispidaria*, including quite black forms, and a series of *Noctua neglecta* var. *castanea*. By using electric light at Chester Mr. Smith had added *Halia brunneata* (2) to the Lancashire and Cheshire List; by the same method he had also taken a fine black variety of *Acronycta alni*; he also showed a fine aberration of *Odonestis potatoria*, a female having normal male colouring.—Mr. W. Mansbridge exhibited two examples of *Cænonympha pamphilus* from Crosby sandhills which were without the usual black spot on the forewings, also four specimens of *Sarrothripus revayana* from North Lancashire.—Mr. H. B. Prince had a box of *Agriades bellargus* from Kent, which included some good under-side aberrations.—WM. MANSBRIDGE, *Hon. Sec.*

RECENT LITERATURE.

Les Insectes. By C. HOULBERT. Second Edition. Pp. 374, 207 text-figures. Paris: Librairie Octave Doin, 1919.

Published as an introduction to the study of the biology of insects. The author devotes most of his space to anatomy and physiology, comparing the variations in structure and function of the homologous parts throughout the Orders, and deals briefly with reproduction, development, etc., but adds chapters on geographical and geological distribution, economic entomology, a short bibliography, and gives an interesting *résumé* of the history of the science. Throughout he makes plentiful reference to the works of others, and has produced a sound elementary work of wide scope, which will probably be of most use to English readers as a means of getting a knowledge of French entomological terminology. N. D. R.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the *Entomologist* is in no way a guarantee for the British nationality, authenticity, or good condition of the Specie. This Notice is not given to this extent on the part of the Editor or Exchangers or Advertisers, but to advise the Editor in respect of duty in cases where it may be allowed should be abused. *Marked & are bad.*

NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than **SIX LINES** can be allowed for each.

Duplicates.—Artemis (new), Agrestis, Bombyliform, Luperina, *Delectata*,—Very numerous.—(Miss) B. A. Cony, Puckchurch, *Globoestershire*.

Papirates.—Selene, *Lo.*, Athrips, *T. ruf.*, Pedaria, *Th. ruf.*, Rumicis, Graminis, Typica, Rubricosa, Chi and Var. Olivacea, Glauca, Umbratica, Pedaria (black forms), Punctularia, Luteola, Albula, Carminea, Immanata, Atrata, etc. *Desiderata.*—Numerous.—G. Mearns, 26, West Grove, Merthyr Tydfil.

Duplicates.—Varleyata, Subroseata, Conspicillaris, Dominica var. Rossica, Irish Cinctaria and Napi, Melane Corsonaria and Corsonaria, Flavaria and others. Also pupae, Scotch Populi and Zozae, Dromedaria, *T. ruf.*, *P. ruf.*, etc.

Perfect, well set, Daxus, Calluna, Aptornis, Lignipeda, *L. ruf.*, Oenochia, B. quereus, Potatoria, Calluna, Asella, Pestudo, Muscoida, Hera, Villica, Gonostigma, Fagi, Fluctuosa, Helmanis, Venosa, Petastris. Liberal exchange.—E. W. Newman, Bealey, Kent.

Desiderata.—The *Entomologist* and *Entomologist's Monthly Magazine* for the years 1917-20 inclusive, bound or unbound. Will give in exchange Lepidoptera, Hymenoptera or Diptera.—Leut. Col. F. G. Nares, 115, Langport Street, Chelsea, S.W. 3.

Duplicates.—Amago, Phragmitidis, Bondi (6), Concedo (2), Vestigialis, Solidignis, Umbra, Crucea (5), Nigricornis various forms, Azatima, Intersecta, Pyramidea, Thelassina, Chenopodia, Lagna, Gracilis, Citriga, *T. ruf.*, *L. ruf.* and many others. *Desiderata.*—Typhon, Waldman, Sumpis, Tithonia, Schizura, Athalia, Cinxia, Artemis and many British butterflies, especially Scotch and Irish larvae.—B. S. Williams, 77, Durham Road, Epsom, Surrey, N. 2.

Duplicates.—Fine Kentish Athalia. *Desiderata.*—Fine Arion and aberrations, local races, etc., of any Battellia, particularly Scotch and Irish forms.—H. W. 7, Albert Villa, Kennington, Nr. Ashford, Kent.

TO CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES BURY, N.W. 2.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, H. Chandos Street, Cavendish Square, W. 1. February 2nd at 8 p.m.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, HOBBS CHAMBERS, LONDON BRIDGE, S.E. 1. Ordinary Meeting, *Thursday, February 10th*, at 7 p.m. Lunch Evening, *Thursday, February 24th*, at 7 p.m. Hon. Sec. STANLEY EDWARDS, F.L.S., &c., 15, St. German's Place, Blackheath, S.E.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 10, White City House, Old Brompton Street, E.C. 2, at 6.30 p.m. Field Society meets on the 1st *Tuesday* in each month, and sectional meetings on the 1st *Friday*. Visitors welcomed at all meetings. Hon. Sec. W. E. Green, 14, Bellet Road, N. 16.

CONTENTS.

South American Eumelipidae, mostly of the Group Colaspini, *Fred C. Bowditch*, 25. An Onitid Fly in British Amber, *T. D. A. Cockerell*, 30. The Macro-Lepidoptera of County Tyrone, *Thomas Greer (continued from vol. liii, p. 277)*, 31. Notes on the Variation of *Peronea cristana*, Fab., with Descriptions of Six New Forms, and the Reasons for Sinking the Names at Present in Use of Six Others, *W. G. Sheldon, F.Z.S., F.E.S. (continued from p. 16)*, 35. The Occurrence of *Thobaldia arctica*, Edw., in England, *Henry F. Carter*, 39. The Heteroptera of Indo-China, *W. L. Distant (continued from p. 6)*, 40. New Forest Notes and Captures, 1920, *Hugh P. Jones*, 41.

NOTES AND OBSERVATIONS. — Disappearance of *Agriades corydon* ab. *syngrapha* from the Chilterns, *H. Bowland Brown*, 48. Butterflies in South Bucks, 1920, *Walter Parry*, 50. Butterflies of Ventnor, 1920, *Ernest Cornell*, 51. *Heliothis pellicera* and *Phyxia hyocera* at Ventnor, *Ernest Cornell*, 51. On *Scoparia ulmicola*, *Ernest Cornell*, 51. Note on British *Epanephile putna*, *John F. H. Thibbe*, 52. *Lampropteryx (Calisto) ottagiata* in South Devonshire, *J. R. Haycock*, 52. *Melipotis Eupithecia lineolata* from Cheshire, *J. F. H. Thibbe*, 52. *Abraxa gigas lineata*, Second Brood, *H. Worley Wood*, 52. *Xanthopan serotina* in November, *H. Worley Wood*, 53. *Ides lactearia* Larva Hibernating, *H. Worley Wood*, 53. *Satex gigas* in a Clyde Shipbuilding Yard, *Alfred J. C. (continued from vol. lxxvii, p. 10)*, 53. *Vesperina* 1920, *J. Sherwin Gilbert*, 53. *Vesperina* 1920, *C. Meadows*, 53. Scarcity of *Vesperina*, *C. Nicholson*, 54.

SOCIETIES. — Southampton and District Entomological Society, 54. Lancashire and Cheshire Entomological Society, 55.

RECENT LITERATURE. — Les Insectes, 56.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

CABINETS.

Finest Materials. Best Workmanship.

Any size made to order.

Drawing on application.

PUPÆ.

Convolutus	5s. each	Elipetor	5d. each	Batis	3d. each
Ocellatus	5d. "	Eucormis	10d. "	Denise	3d. "
Tidus	4d. "	Egri	11d. "	Orior	6d. "
Pipuli	3d. "	Alia	19d. "	Carpini	5d. "
Porcellus	1s. "	Carmilite	13d. "	Montastri	3d. "

Box and Postage 4d. extra.

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

Vol. LIV.]

MARCH, 1921.

[No. 694.

THE

ENTOMOLOGIST

AN

ENTOMOLOGICAL JOURNAL

Illustrated Monthly Journal

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S. W. J. LUCAS, B.A., F.E.S.
H. ROWLAND-BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.
W. L. DISTANT, F.E.S., &c. DR. D. SHARP, F.R.S., F.E.S., &c.
F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.
C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON

ADLARD & SON & WEST NEWMAN, LTD.,
BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also

Birds' Eggs

(Single as well as in Clutches)

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION
36, Strand, London, W.C.2.

“ENTOMOLOGIST”

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 3) can be supplied separately at the following prices: 1890 to 1911, 1s. each; double numbers, 2s. each; 1915 and 1916, 9d. each; double numbers, 1s. 6d.; 1917 and 1918, 1s. 6d. each. Bound Volumes for 1890 to 1911 can be supplied except 1910 (Vol. 3) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

FOR SALE. Five specimens, at per each: *Lucina*, *Cinxia*, *Aglaia*, *H. comma*, *Monacha*, *Laestris*, *Tritici*, *Valligera*, *Verbasci*, *Autumnaria*, *Flavicornis*, *Trilinea*; *Crago*, *Plantaginis*, 2d. (1.9 doz. maxon); *Melipot*, *Cespitis*, *Syringaria*, 3d.; *Pachyma*, *Suasa*, *Contigua*, *Phragmitidis*, *Primaria*, 4d.; *Asteris*, *Absinthii*, 6d.; *Phos*, *Exulans*, blotched *Trifolii*, 9d.

A. J. SPILLER, CHINNOR, WALLINGFORD.

MAR 19 1921

posit

THE ENTOMOLOGIST.

VOL. LIV.]

MARCH, 1921.

[No. 694

SOME NOTES ON REARING *EREBIA EPIPHRON*.

BY THE LATE J. ALDERSON.

[The following paper was placed in my hands by the late Mr. Alderson for inclusion in my then contemplated monograph of *Erebia epiphron*. The late Mr. Tutt had evidently intended it for his never completed "Natural History of British Butterflies" (*cp. Ent. Record*, vol. xviii, p. 265).—H. R.-B.]

The ova were laid by a ♀ taken at Honister Pass on July 1st, 1906, by my friend Mr. George Wilkinson of Workington. The insect was *in cop.* when captured, and Mr. Wilkinson boxed both the ♂ and the ♀ in one pill-box, and sent the box to me by post. Both insects were alive when I received them, and the ♀ had already commenced ovipositing, undeterred by its confined conditions or the presence of the ♂.* About forty ova had been laid, chiefly on the sides of the box; a few were attached to the top and bottom of the box, and others were unattached. I took the ♀ out of the box and placed it with some cut blades of grass in a tumbler, the mouth of which I covered with leno. The insect very soon commenced ovipositing on the grass blades. I placed the tumbler outside on the window-sill, in such a position that the insect would get sunlight, but not the direct rays of the midday sun. Sunlight, however, did not seem to be a necessary factor in the process of egg-laying, for oviposition took place both when the sun was shining and when it was obscured. On the first day of the insect's confinement in the tumbler about fifteen ova were deposited on the grass-blades; about twelve were laid on the second day, and only three or four on the third day. I had fed the insect each day, but on the third day after its arrival it seemed to have little strength left, so I placed it in the cyanide bottle. One or two of the ova had been deposited on the leno covering of the tumbler, and the remainder were laid on the blades of grass. On several occasions I watched the process of oviposition. Before depositing the egg, the insect, clinging to the grass-stems, incurved her abdomen, often to an extreme degree, and felt about with the tip of the abdomen among the blades of grass for a suitable position in which to place the ovum. On one

*It is a very easy butterfly to get ova from. I find the ♀ generally lays a few eggs in the pill-box.—G. W.

occasion the tip of the abdomen, while feeling about in this manner for a grass-stem, came in contact with one of the insect's legs, and, much to my surprise and amusement, she immediately laid an egg on this leg. I brushed off the egg, and it stuck to a blade of grass.

The ova are canary-yellow in colour when first laid. I did not take any note of the ovicular colour changes which preceded the emergence of the larvæ, and although I noted down the date of larval emergence, I regret to say that I mislaid this note. I cannot say how many days were passed in the egg state.* When the larvæ emerged I was quite at a loss with regard to a food-plant, for I was not acquainted with *Aira præcox*, *Deschampsia cæspitosa*, *D. flexuosa* or *Nardus stricta*, which appeared to be the favourite food-plants of this larva. I tried the larvæ with *Juncus* and with one or two species of grasses growing on the commons hereabouts, but none of these was eaten. As a last resource I tried some grass growing in the garden, which, by the way, was the same on which the ♂ butterfly had oviposited in the tumbler. I was very pleased to see the larvæ commence feeding at once on this grass, and this afterwards formed their sole food-plant. I did not at first know what species of grass this was, but subsequently I learned from Dr. Chapman that it was *Poa annua*, and this, of course, is mentioned by several authorities as a food-plant of *E. epiphron*. While the larvæ were small I confined them in glass-topped metal boxes, and these kept the cut grass fresh for a day or two. As the larvæ grew in size I adopted the rearing methods detailed by Dr. Chapman on p. 74 of Pt. II of "Practical Hints for the Field Lepidopterist." I used several tumblers, and placed about six or eight larvæ in each tumbler. On the bottom of each tumbler I put a piece of blotting-paper cut to fit exactly, and under the lid I fitted another piece of blotting-paper. The lid of the tumbler consisted of the glassed-topped lid of a $3\frac{1}{4}$ -in. metal box. The tumblers were cleaned out and the larvæ given fresh food every alternate day. Under this plan the grass kept fresh and the blotting-paper absorbed any undue moisture. To change the air in the tumbler and prevent it becoming noxious, I took off the lid of the tumbler once or twice daily and waved the tumbler backwards and forwards in the open air. The larvæ were all kept under the same conditions in a small outhouse which had a southerly aspect. The door of this outhouse was kept open, and the tumblers containing the larvæ were placed on a shelf just within the door. The larvæ were thus sheltered from the sun's direct rays and from inclement weather, while the temperature would approximate to that of the open air. Under these conditions the larvæ fed up well and steadily; but by mid-August four had outstripped their fellows, being much larger and feeding greedily, while the rest were

* Eighteen to twenty days is correct.—G. W.

eating very little. This led me to expect an autumnal emergence, though I had not heard of it being recorded in connection with *E. epiphron*. At the end of August one larva laid up for pupation, and assumed the pupal state on September 2nd; from this pupa a ♀ insect emerged on September 11th. A second larva pupated on September 9th, producing a ♂ imago on September 28th. A third larva pupated on September 16th. I sent this pupa to Mr. Main for photographic purposes, but it probably received some injury while travelling, as it died soon after arrival. A fourth larva pupated on September 18th, and produced a ♀ insect on October 5th. It will thus be seen that the first insect passed nine days in the pupal state, the second nineteen days, and the third seventeen days. This variation was probably due to the difference in the temperature between September 2nd (the first date of pupation) and October 5th (the last date of emergence).

At this stage the remainder of the larvæ were (and had been for some weeks) feeding very little, and were about $\frac{5}{16}$ to $\frac{3}{8}$ in. in length. On October 18th I placed two of the larvæ in a glass-topped metal box, and put this on the kitchen mantel-piece in order to see whether the increased warmth would induce them to feed up. I kept them there for about a fortnight, but these larvæ ate no more during this period than they did under normal conditions, so I did not carry the experiment further. By the end of October the remaining larvæ were feeding very little, and as I had been losing several about this time by the method of close-rearing in tumblers, I decided to alter the treatment and keep them under more natural conditions during the winter. My stock of larvæ had now been reduced to eighteen, and on November 1st I placed these on some *Poa annua* which I had growing in a flower-pot. I confined the larvæ by means of a glass cylinder with a lino covering to the top, and placed the whole in the garden in the open air. The larvæ took up their positions on the grass-stems, and moved about very little, and then only in mild weather. In early January I made a close search for the larvæ; I found several dead ones, but only one living one, so, although others may be hidden at the roots of the grass, I have little hopes of being able to carry any beyond the hibernating stage.*

I must here express my regret that I did not take careful notes with regard to the larval habits and the different larval changes, and that the larvæ were not in hands more competent to work out the full life-history of this species. The few notes that I offer with regard to larval habits, etc., are jotted down entirely from memory, and will, I am afraid, possess little value.

Except at its first instar, the larva throughout is of a bright grass colour, assimilating perfectly to the green blades of *Poa annua*. It is, on this account, difficult to locate even in the

* None of these passed the hibernating stage.—J. A.

confined area of a tumbler, especially as its resting attitude, its shape, and the longitudinal lines along its body all serve to render it less conspicuous. It rests almost invariably with its body fully extended and closely pressed to the edge of a grass-blade. The body of the larva tapers at both extremities, thus forming a curve which reaches its highest point about the middle segments, so that when the larva assumes its resting attitude on a grass-stem there is no abrupt break to catch the eye in the outline of the blade of grass beyond a gentle swelling where the larva is resting. The larva feeds during the day, and occasionally I have seen it feeding by night, but my observations were not close enough to enable me to state with any certainty whether it is an habitual night-feeder. When feeding, the larva clasps the edge of a grass-blade and eats into the blade, working downwards, and seldom eating beyond the midrib; but occasionally the blade of grass is eaten right through. Mr. Tonge's excellent photo. of the larva admirably illustrates the attitude it adopts when feeding; this photo. was taken in September, and shows the hibernating size of the larva, for none (except the four that pupated) moulted again after mid-August. I cannot remember the exact date of the last moult before hibernation, but certainly it was not later than this. The point that struck me most with regard to the habits of the larvæ was their extreme lethargy. All their movements were performed with the utmost deliberation. It was very seldom I observed one on the move, either by day or by night, and when they did move the process of travelling appeared most laborious and painfully slow. The only time a larva was at all restless was when it was full-fed and was apparently searching for a suitable place for pupation. At this period the larva travelled all round the tumbler, climbing up and down the grass-blades in search of a suitable place. This restlessness lasted from one to two days, I believe, but I cannot be certain of the exact time. In the four cases in which pupation took place, the larvæ, after all their wanderings, settled down for pupation in practically identical situations. In each case the position chosen was on the blotting-paper that covered the bottom of the tumbler, amongst the bases of the grass-stems. Here a few strands of silk were spun apparently at random amongst the grass-stems. The amount of silk used by the four larvæ varied, but I do not think that at the most more than a dozen strands were spun by any of them; in one instance I was under the impression that no silk had been spun, but as my observations had been only cursory, it is quite possible that the silk (if any were spun) might have escaped my notice. However, I can say that in these four instances of pupation the puparium was of the slightest possible description—so slight, indeed, as to give the impression that it is but the faint remaining trace of a former well-developed habit. I cannot definitely say that all the pupæ

possessed an anal attachment, but when turning one of the pupæ out of the tumbler I noticed that it hung by the anal segment by a strand (or strands) of silk. My impression is that all the pupæ were not so attached, and in any case the attachment was but slight. In all four cases, as I have noted above, pupation took place at the bottom of the tumbler, and in all four cases the larva, during the change to the pupal state, was touching, if not actually resting on, the blotting-paper; after the change the pupa was resting on the paper, and did not depend on the strands of silk for its support. In three instances the larvæ went through the process of pupation with the dorsal surface on the blotting paper and the ventral surface uppermost; but in the fourth instance the position was reversed, and the ventral surface of the larva remained throughout on the blotting paper. After the puparium had been spun, the larva remained quiescent for some time preparatory to the change to the pupa. I am under the impression that one day was occupied in making the puparium and settling down for pupation, and that about two days were passed in the quiescent state; but this is a point upon which I cannot speak with any certainty. Nor can I say anything with regard to the operation of changing or the time thus occupied. The larva retains its green colour throughout, and the newly-formed pupa is of a bright transparent green, this colour, of course, not retained throughout the whole pupal state, but little change can be detected for some days, the only difference being that the colour gets slightly duller and less transparent. Dr. Chapman's description of the fourth pupa* was made when it was four or five days old; it may be well to mention also that this pupa produced a ♀ imago, and that Mr. Tonge's photograph shows the same pupa, for this pupa was more dumpy than that which produced the ♂ imago.

I kept the fourth pupa under observation, and took some notes of the changes in colour which preceded emergence. On September 30th I observed the first decided change in the appearance of the pupa. A distinct, though not striking, change in coloration had taken place between the date of pupation (September 18th) and September 30th, the green colour having lost in brightness and intensity and the pupa being altogether of a much duller appearance, but this change had been so gradual that, until September 30th, it was not possible from one day to another to observe any perceptible difference in the colour of the pupa. On September 30th, however, the appearance of the pupa showed a distinct advance on that of the preceding day. I will give the notes as I took them down, commencing with the date that showed the first decided change in the appearance of the pupa.

September 30th, forenoon: The eyes have assumed a brownish tint; there is a slight darkening about the mouth-parts. The

* Not with MS.—H. R.-B.

wings are fading from green to a creamy colour, and the brown linear markings on the wing-cases seem more intense, but this intensity is probably more apparent than real, owing to the lighter ground-colour of the wings; the dark central thoracic line also appears to have gained in intensity. The green colour of the abdomen shows little signs of change.

October 1st, forenoon: The eyes are of a more pronounced brown; the mouth-parts are much darker than they were the previous day; the wings are now of a creamy colour, and have quite lost any trace of green. A dark shading appears on the thorax towards the head, and the dark line down the centre of the thorax is much more pronounced; a change also appears in the abdomen, which is now of a greenish-white colour.

October 2nd, midday: The wings are now of a buff colour, tending towards a faint brown over their central area; the dark shading has now fully occupied the thorax, and is extending to the abdomen. The dark line down the centre of dorsal surface of abdomen is much more intense, being almost black on the fourth, fifth and sixth abdominal segments. The appearance of the pupa is now quite changed from that of three days ago: the only indication of green (a faint greenish-yellow) that can now be observed is on the abdomen, being most pronounced on the sides, while the deepest shade of brown is in the region occupied by the mouth-parts, legs, etc.

October 2nd, midnight: The wings are of a decided brown colour, deep enough to obscure the linear markings on the wing-cases, the central area of the wings being much darker than the margins. The dark shading on the thorax is now so intense that the central dark line is almost unnoticeable. The antennæ attract attention owing to their being slightly lighter than the colour of the surrounding parts; the abdomen shows little further change.

October 3rd, 10 a.m.: The wings are now of a very dark brown colour; the fulvous area on the fore wings shows very clearly through the pupal casing, and the black dots within this area can easily be made out. The dark line down the centre of the thorax is still discernible, and along this line rupture takes place during dehiscence. Except in the abdomen, which is the last part of the pupa to undergo change, there is little further difference in the appearance of the pupa. Change in the abdomen is taking place from two centres, and consists of the dark shading before mentioned; one of these centres is the dark line down the centre of the dorsal surface, and the other is a similar dark central line down the ventral surface of the abdomen. These lines, which are most pronounced, are gradually increasing in area, the dark shading fading off laterally; the abdomen therefore shows lightest on the sides, and is here of a drab colour with only the faintest suggestion of yellow.

October 3rd, 2 p.m.: The dark shading has now occupied the

whole of the abdomen; it is slightly lighter on the sides, and reaches its deepest shade along the dorsal and ventral abdominal lines; beyond this there is no further change in the pupa.

October 3rd, midnight: The colour of the abdomen throughout is now as deep as, and similar to, that of the thorax, and the ventral and dorsal abdominal lines are now unnoticeable.

Between this last observation and the date of emergence there was no appreciable difference in the appearance of the pupa. To sum up the appearance of the pupa: at this stage the wings are of a dark brown colour, with the markings on the fore wings showing clearly through the pupal casing; the thorax and abdomen are of a different shade, tending more towards a dark sepia shade, or wood-louse colour. The two different shades (that of the wings and that of the thorax and abdomen) are reached, as I have shown in the above notes, through two different processes. In the former the brown is evolved through a fading of the green to cream, then cream to buff, and finally buff to brown; but the dark coloration of the thorax and abdomen is attained in a different way; in these parts the first change consists of a faint dark shading (almost suggesting decomposition of the subjacent area) showing through the green; this shading, absorbing all the green colour, gradually gains in intensity and opacity until it reaches a dark sepia or wood-louse colour. The colour of that part of the pupa occupied by the mouth-parts, legs, etc., is a blackish brown. The eyes, which are the first part of the pupa to show any signs of darkening, are at this stage, with the exception of the antennæ, lighter in colour than any other part of the pupa. In the mature pupa there is a very faint suggestion of a whitish powdering, more noticeable about the interstices of the abdominal segments.

I noticed the first change in the appearance of No. 2 pupa—the fading of the wings and the darkening of the eyes—on September 23rd, five days before emergence, which is identical with that of No. 4 pupa. I did not take any notes regarding the pupal changes in No. 1 pupa, but I have the impression that the change and emergence covered much less time than was occupied by the other two pupæ, and as the first pupa remained only nine days in the pupal state, which is probably nearer the normal period, it is likely that this impression is correct.

With regard to the time of emergence, the first two insects emerged between 11 and 12 a.m., and the third emerged some time before 10 a.m.

NOTES ON THE VARIATION OF *PERONEA CRISTANA*,
FAB., WITH DESCRIPTIONS OF SIX NEW FORMS,
AND THE REASONS FOR SINKING THE NAMES
AT PRESENT IN USE OF SIX OTHERS.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 39.)

There is one feature that strikes one forcibly in looking through this collection—that the size of the button is rapidly increasing. This is not my own view only: amongst others Mr. South, whose knowledge of the species far antedates mine, has pointed it out, and there does not seem to be any doubt about it. With the exception of the *ruficostana* group one rarely nowadays sees a specimen without a button. On the other hand, all the forms without buttons, or with only small buttons, were either named in the first half of the last century, or they were named from old specimens (of course excluding some of the *ruficostana* group), as the following list of names will show: *Alboflammata*, Curt., *xanthovittata*, Dsvgs., *unicolorana*, Dsvgs., *prochantana*, Clark (from old specimens), *vaughaniana*, Webb (old specimens), *prostria*, Clark (old specimens) *fulvana*, Sheldon (old specimens). Of these forms the only modern examples I have seen alive are one each of *prostria* and *xanthovittata*.

The Webb series contains so many rare forms it will perhaps be interesting to enumerate the most important of them, including—

Ab. *alboflammata*, Curtis. A fine series of 24 examples, all old and on white pins, including 5 Bond, 1 Clark, 2 Harper, the rest unlabelled.

Ab. *subalboflammata*, Clark, the type, and 4 others, one of which is labelled "Clark Colln.,"; the others are unlabelled, but presumedly they are from the same source.

Ab. *unicolorana*, Dsvgs. Thirty-three examples, all on white pins, 9 of them on the old round-headed pins, 10 labelled "Bond," 1 "Burney," 1 "Clark," the remainder unlabelled.

Ab. *xanthovittata*, Dsvgs. A fine series of 17 examples, including Clark's type of *proxanthovittata*, which is without data. All are old specimens on white pins, 7 labelled "Mason," 1 "Clark," and 1 "Bond," the remainder are without data.

Ab. *nigropunctata*, Clark. The type (without data, a somewhat old specimen mounted on a gilt pin), and 7 others, of which 1 is labelled "New Forest, 1891, S.W.," 2 "Bond," 1 (on black pin) "New Forest," probably from Clark Collection, 1 on black pin, unlabelled, but probably from Clark, and 2 old specimens on gilt pins, unlabelled.

Ab. *prochantana*, Clark. The type (without data) and 12 others all on white pins, one of which dates *ante* 1850. All are without data except one, which has been labelled by Webb, "Clark."

Ab. postchantana. This is of course one of Webb's creations, which he describes as having a dark button; he writes of his series (*loc. cit.*, vol. xlv, p. 290) as consisting of "4 specimens purchased at Clark's sale." There are 4 examples labelled this form in his series, but one has a white button, and is therefore *ab. chantana*, Curt. He writes (*loc. cit.*) that he has long had this form in his cabinet. What has become of the specimens does not appear. Mr. South has two examples of this form from the New Forest.

Ab. vaughaniana, Webb. The series under this label consisted of 8 specimens, and there was another amongst the *unicolorana*. They are all old examples mounted on white pins, and are without data.

Ab. lichenana. Two unlabelled specimens on white pins.

Ab. ruficostana, Curtis. Seven good examples, all without data, except one labelled "Burney." Probably most of these came from Clark, especially 3 on black pins; the remainder are old and on white or gilt pins.

Ab. attaliana, Clark. The type-specimen, without data, but set on a black pin, and presumably coming from the New Forest. This specimen is, so far as I know, unique, for though there is a second specimen put with it, this is, as Webb says (*loc. cit.*), only an example of *alboruficostana*, Clark.

Ab. nigrocostana, Clark. The type and 6 others. This form seems to be getting a little more frequent; I have 4 from the New Forest and 1 from Epping Forest, all taken by myself. Mr. South has 9 examples, all from the New Forest.

Ab. transversana, Clark. The type and 3 others, all without data, but old examples, set on white pins, and presumably from the Clark Collection.

Ab. prostriana, Clark. The type (without data) and 19 other fine examples, all on white pins, 2 *ante* 1850, 9 labelled "F. Bond," the remainder unlabelled.

Ab. insulana, Curt. Twenty examples, the majority on white pins; 6 labelled "Bond," the remainder are without data.

Ab. profanana, Fab. There are 31 specimens under this name, 4 of which are *substriana*, 9 *subunicolorana*, and the remainder accord with Stephens' idea of *profanana*. These are all old specimens, on white pins, 12 labelled "Bond," 1 "Epping Forest," the remainder are without data.

Ab. provittana, Dsvgs. The only specimens in the series of *cristana* that fit in with Desvignes' description are, as before stated, 10, most of which Webb had included in his series of *nigropunctana*; 7 of these are on gilt pins, 2 of which are labelled "Bond Colln.," the others are without data. The remaining 3 are more modern; they are mounted on black pins; 1 of them is labelled "Clark," the other 2 have no label. I regard this form as a very rare one nowadays. Most of Desvigne's *Peroneas* came

from Whittlebury Forest in Northants, which now, I believe, owing to enclosure and consequent changes, no longer produces this genus—at any rate in the old profusion.

Semistriana, Dsvgs. Webb speaks of this (*loc. cit.*) as very rare, and his series consists of 4 examples—2 on gilt pins labelled “Bond,” 2 on black pins, probably from Clark; I do not find *semistriana* very rare in the New Forest nowadays; I have 12 examples from there.

Jansoniana, Webb. Eight specimens, all from Clark, without data, but from Webb’s note (*loc. cit.*) one would infer they came from Epping Forest. I question this, for I have never taken one there; nor have I heard of anyone who has. In the New Forest nowadays it is not uncommon; I have 8 taken by myself there, and Mr. South also has some from the same source.

Procrystalana, Webb. There are 5 examples, all modern specimens, mounted on black pins, probably from Clark, but they are without data. I regard this as a very rare form; I have only two examples, which were obtained in the New Forest.

The cream of the Webb series consists of the rare and beautiful white forms, of which there are no less than 117 examples. These consist of—

Ab. capucina, Johnson. Of this rare form there are 16 examples, all old specimens, set on white pins; 2 are labelled “Burney Collection,” the others are without data, but I gather that the bulk of them came from the Mason Collection.

Ab. subcapucina, Dsvgs. A magnificent series of 67 specimens, very variable, and including one with a black button, and several with pure white basal areas to the superiors. There are 26 beautiful examples from Folkestone, taken by Mr. Purdey; most of the others are older specimens, mounted on white pins, half a dozen of which would date *ante* 1850; 7 of these are labelled “Mason,” 2 “Bond,” 2 “Edwin Sheppard,” 1 “Sorell (Deal),” and 1 “Standish”; the others are without data.

Ab. purdeyana, Webb. There are, of course, the two specimens Webb got from Clark, one of which is the type, and also two others which were included with the *subcapucina*, one of these is labelled, in Webb’s writing, “from Dr. Mason lot 22. Folkestone W. Purdey 1884”; the other is without data. These specimens are very interesting, because Mr. Purdey does not remember taking any previous to 1892, but there is no doubt but that they were pinned and set by him. There was a fifth specimen of *purdeyana* amongst the *subcapucina*. This is old, and set on a white pin. Mr. Purdey informs me that in addition to the 4 in the Webb Collection, which are set in his style, he has taken in all 7 specimens, 6 of which he possesses and the other is in the collection of the Hon. N. C. Rothschild.

Ab. gumpinana, Johnson. There are 6 fine examples of this rare form, all old and mounted on white pins, with the following

data : Two from Dr. Harper, 2 from Mason, and 2 from Standish. Commander Walker has kindly examined the series of *cristana* in the Dale Collection at Oxford, and he informs me there is included in it a specimen of ab. *gumpinana*, labelled "New Forest, Johnson." This is probably the type-specimen. Nearly allied to this form is an example which is probably unique ; it resembles in all respects *gumpinana*, with the exception that it is without the white vitta ; it came from Dr. Mason.

Ab. *masoniana*, Clark. There is the type-specimen, which is without data, but respecting which Webb says that he gathers it came from Dr. Mason. There are also 4 other specimens identical with it in that they have its most characteristic feature, the ochreous vitta, but they have white buttons in place of the ochreous one which obtains in the type-specimen. One of these is labelled "New Forest. Clark. 1893" ; 1 "Burney's Duplicates" (what a delightful duplicate !) ; 1 "Stevens & Mason Collns." The fourth example came from Dr. Harper's Collection. All these, with the exception of Clark's specimens, are old, and set on white pins. This is one of the rarest forms of *cristana* ; the only other examples I know of are two in Mr. South's Collection, which—and I fancy most, if not all of the others—came from the New Forest, and one in the Dale Collection at Oxford.

Ab. *tolana*, Dsvgs. Of this rare and beautiful form there are 6 fine examples, 3 of which were taken at Folkestone by Mr. Purdey ; 1 is labelled "Burney Collection," 1 "Vaughan, Stevens & Mason Collns." ; the other specimen is without data. Mr. Purdey informs me *in litt.* that he has at various times taken five of this form, all at Folkestone.

Ab. *curtisana*, Dsvgs. = *charlottana*, Clark. Of this, which Webb truly says is the most beautiful of all the *cristana* forms, there are, as previously stated, 3 examples, 1 from Clark, 1 Mason, and 1 without data.

Ab. *ochreana*, Sheldon. There are 5 examples of this form, all old, set on white pins, 2 from Harper, 2 from Burney (one dating *ante* 1850), and the fifth without data.

Ab. *flavana*, Sheldon. Two examples from the Clark Collection, one labelled "New Forest."

Webb's series contains the type-specimens of all the forms named by Clark in addition to those enumerated above.

Youlgreave,
South Croydon ;
September, 1920.

THE HETEROPTERA OF INDO-CHINA.

By W. L. DISTANT.

(Continued from p. 44.)

Menida salvazana, sp. n.

Body above dull ochraceous; head centrally and laterally (sometimes almost wholly) two anterior spots, the basal area and sometimes a central transverse undulating line to pronotum, a large sub-basal spot and two smaller marginal spots before apex of scutellum, and a central and a larger apical spot to corium dark metallic green, sometimes almost black; membrane hyaline or subhyaline; body beneath and legs (imperfectly seen in carded specimens) more or less brownish ochraceous; above somewhat thickly and coarsely punctate; antennæ with the second and third joints shorter than the fourth and fifth joints.

Long, $6\frac{1}{2}$ –7 mm.

Tonkin; Luang Prabang; Haut Mékong.

NEOJURTINA, gen. nov.

Allied to *Jurtina*, Stål, but with the basal joint of antennæ reaching and slightly passing the apex of head; rostrum not or scarcely passing the base of the abdomen. Other characters as in *Jurtina*.

Neojurtina typica, sp. n.

Head ochraceous, the lateral marginal areas finely darkly punctate; antennæ pale castaneous, third and fourth joints longest; eyes black; pronotum with the anterior half ochraceous, with its margins distinctly paler, posterior half and the scutellum and corium darker castaneous, lateral marginal areas of the corium stramineous, the whole upper area thickly and somewhat coarsely punctate; body beneath, legs and rostrum stramineous; abdomen with a deep broad central longitudinal furrow.

Long, 16 mm.

Tonkin

EPAGATHUS, gen. nov.

Body obovate, head a little longer than broad, moderately narrowing to apex, which is slightly cleft, the lateral lobes being slightly longer than the central lobe, lateral margins moderately convex; antennæ five-jointed, basal joint not reaching apex of head; rostrum reaching the posterior coxæ, first joint about reaching base of head; pronotum twice as broad as long, the lateral angles broadly extended a little forwardly and upwardly; scutellum about as broad at base as long; membrane slightly passing the abdominal apex; base of abdomen with a short obtuse tuberculous spine arising from the second segment; basal margin of pronotum straight.

Allied to *Sabæus*, Stål.

Epagathus chapana, sp. n.

Pale olivaceous green, thickly and somewhat coarsely punctate, membrane shining bronzy brown; antennæ pale greenish, apical area of the fourth and the whole of the fifth joint reddish ochraceous; basal joint not reaching apex of head, third joint shorter than second, fourth or fifth joints; body beneath paler than above, rostrum, disc of sternum, bases of femora and the tarsi more or less ochraceous; rostrum more or less ochraceous and reaching the posterior coxæ; body above thickly and rather coarsely punctate.

Long, $10\frac{1}{2}$ to 13 mm.

Chapa.

UDONGA, gen. nov.

Body elongate; head a little longer than broad, lobes of almost equal length, lateral lobes strongly oblique near apex; antennæ with five joints, basal joint stoutest, not reaching apex of head; rostrum moderately stout, about reaching posterior coxæ; pronotum broader than long, the anterior lateral angles shortly toothed, the posterior lateral angles almost perpendicularly spinous; scutellum elongate, about apical fourth narrowed and extending beyond the middle of abdomen, which is only moderately posteriorly narrowed and has the apical angles of the sixth segment shortly but prominently toothed.

I have placed this genus near *Dabessus*, Dist.

Udonga spinidens, sp. n.

Body above brownish ochraceous, thickly and somewhat coarsely punctate; head more darkly punctate, eyes blackish; antennæ dark ochraceous, basal joint, and fourth joint excluding base and apex, blackish; rostrum moderately stout and reaching posterior coxæ, pale castaneous in hue; body beneath stramineous, somewhat sparingly and coarsely punctate, abdomen with three more or less broken longitudinal dark fasciæ; antennæ with the first and second joints shortest, the first robust; the abdomen with the area of the spiracles distinctly darker and more blackish in hue.

Long, 12 mm.

Haut Mékong; Pang Tiac.

Paterculus aberrans, sp. n.

Brownish ochraceous with small pale ochraceous mottlings; narrow lateral margins of the pronotum and narrow basal lateral margins of the corium pale sanguineous; head beneath, sternum and legs pale ochraceous, the sternum darkly punctate; abdomen beneath darker ochraceous, the segmental incisures, stigmata and a double sublateral series of spots, black; antennæ pale ochraceous, third and fourth joints longest; rostrum reaching the intermediate coxæ.

Long, 12 mm.

Luang Prabang; Muong You.

Allied to *P. affinis*, Dist., but with the apex of the rostrum only reaching the intermediate coxæ.

NEW FOREST NOTES AND CAPTURES, 1920.

BY HUGH P. JONES.

(Continued from p. 48.)

Osmia: This family is apparently very scarce here. None seen, although I made no special hunt for them. With the exception of *parietina* and *leucomelana* I have taken all the species in Cambs.

Anthidium manicatum occurred in Lymington gardens.

Melecta: Only *M. armata*; found in the greatest abundance at "Perry Wood" (Brockenhurst), in May and June. *Anthophora retusa* and *A. pilipes* from same locality, the former much the commonest, reversing the usual order, whilst *A. quadrimaculata* was quite plentiful on banks at Norley Wood and other places, but always apart from *Sarapoda bimaculata*, even when the latter is found in the same gravel-pit as at Setley, each species keeping to its own corner. The plaintive high-pitched hum of these two chubby little bees is quite a characteristic of the heaths in August. It may be my fancy, but *bimaculata* seems to possess a shriller note than its ally.

Psithyrus: *Ps. rupestris* (males only taken), *Ps. barbutellus*, *Ps. vestalis* (the latter very commonly).

Bombus: *B. venustus*, *agrorum*, *hortorum*, *lapidarius* and *terrestris* were all fairly common, but such species as *sylvarum*, *pratorum* and *derhamellus* were rather unaccountably absent. I used to take *pratorum* in great abundance at raspberry flowers in a Cambridge garden.

A few males of *B. jonellus* from heaths complete my list of Aculeates.

DIPTERA.—Even the "forest fly" was scarce this summer, and I have few species to record. Typical forest things such as *Tabanus bovinus*, and *Echinomyia grossa* were totally absent in places where they were abundant in 1919. *T. bovinus* I only found at Lyndhurst in July, but a solitary ♀ (?) was heard at Park Hill in August. What a difference compared with last year when collectors were almost driven out of some enclosures by the bites of *Chrysops*, *Tabanus*, etc. *Therioptes tropicus* and *Tabanus maculicornis*, however, were exceptions to the general rule, both being unusually abundant in the spring; the former being especially so at Rhinefield, completely routing my sister, who was there with me at the time.

After June, however, it was a rare thing to see a *Tabanid* of any description, everyone commenting on the fact that there were so few flies. Unfortunately, one could not enjoy the absence as everything else seemed to have disappeared also, notably those fine aberrations of *D. paphia* and *L. sibylla*, the presence of which one had come to look upon as an annual event of increasing

popularity and importance. The following is a short list of my most interesting captures in Diptera. Some of the dates given are remarkably late: *Pedicia rivosa* and *Tipula gigantea*; *Stratiomys potamida* (Royden on *Umbelliferae* in July); *Hæmopotia pluvialis* and *H. crassicornis* (the latter at Wood Fidley); *Theriopectes solstitialis* and *distinguendo*, Verr.; *Th. tropicus* (latest date of the former—a perfectly fresh ♀—September 10th!).

Atylotus fulvus was very scarce and erratic in appearance in June, and then again in August, when I took a fine ♂ on Setley Plain. *Tabanus bovinus*, *T. bromius* and *T. maculicornis*, all found (the latter very abundantly), but *T. autumnalis* not seen this year.

Chrysops cæcutiens and *C. quadrata*. These very handsome "blood-suckers" were both unusually scarce, and a female of the former was taken as late as September 20th at Royden. *Dioctria atricapillus*, *Laphria marginata*, *Asilus crabroniformis* (scarce in August at Norley Wood and Setthorns); *Neoitamus cyanurus* and *Machimus atricapillus*. *Anthrax circumdatus* was found at Setley amongst the bee *A. quadrimaculata*, and the only *Bombylius* seen was *B. major*. *Empis tesellata*; *Chilosia sparsa*; fine forms of *Syrphus*; *Rhingia campestris*; *Chrysochlamys cuprea*; *Sericomyia borealis* (always very common); *Chrysotoxum festivum* and *C. bicinctum*. The family *Xylota* was, as usual, much in evidence, *X. sylvarum* being first in point of numbers, but *X. florea*, *lenta*, etc., followed fast. *Conops certiiformis* (two forms), *C. quadrifasciata* and *Physocephala rufipes* amongst the *Conopidae* were all taken; also *Sicus ferrugineus* (scarce), and *Myopa buccata*. *Alophora hemiptera* was common on flowers of privet in June at Park Hill, where *Acrocephalus globulus* was "beaten" later.

Echinomyia ferox and *E. grossa* were not seen this year south of Brockenhurst, whilst *Miltogramma punctatum* was common at the burrows of *Colletes*, etc., during August and September.

As previously stated, *Hippobosca equina* was unusually scarce, although a smashed caravan on one side of the road at Stockley enclosure, and a plunging horse tied to a tree at the other, suggested this wretched parasite, but might only have been due to a motorist.

COLEOPTERA.—All remarkably scarce. I merely mention the following as they are typical forest beetles, and more or less local.

I have to thank Mr. G. Gulliver for obtaining several fine *Longicornia* for me, notably the imposing *Prionus*.

Calasoma inquisitor (this year hardly obtainable); *Necrophorus vespillo*; *Silpha thoracica* and *S. quadripunctata*.

Lucanus cervus (the "stag-beetle" is very abundant in Lymington gardens, and wood yards, and flies commonly in the streets at dusk).

(To be continued.)

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 30.)

Colaspis klagii, sp. nov.

Like a small *trivialis*, Boh. Above, shining bronze, below, brown; legs rufous with knees and tarsi more or less darkened; antennæ rufous, darker at last two or three joints; thorax punctured, smooth and convex, strongly obtusely angled at the middle; elytra regularly geminate punctate, striate, with raised, smooth longitudinal intervals, costate at the apical end, the extreme reflexed edge of the thorax and elytra and all the punctures cyaneous; hind ♂ tibia abruptly angulate within at the middle.

Type, ♂ and ♀, Amazon Valley, near Santarem (Klages).
Length, 4.5–5 mm.

Resembles a small *interstitialis*, Lef., and probably mixed with it in collections, but separable by the ♂ tibia. Head closely punctate with a flattened depression on the front and the usual smooth calli; thorax evenly convex and the punctures only slightly more crowded at the sides, elytral punctuation very regular, hardly disturbed at the scutellum or sides. *Klagii* and *dilatipes* belong to the *interstitialis* group; from analogy I infer that probably *subænea*, Jac., and *lefevrei*, Bow. (*geminata*, Lef.), have dilated ♂ tibia.

Colaspis punctipennis, sp. nov.

Size of a small *trivialis*, Boh; elongate. Brassy æneous, shining; legs, palpi, labrum and antennæ rufous, the latter fuscous at the end; head densely punctate except the extreme vertex; thorax coarsely punctate and sinuate, bidentate at the sides; elytra everywhere grossly, almost foveate, punctate, transversely confluent, forming rugæ everywhere, except the sides and apex, where there are the usual costæ; inner edge of hind tibiæ sharply, angularly dilated below the middle.

Type, ♂, Teresopolis (first Jac. Coll.).
Length, 6 mm.

Head with broad triangular depression in front, the usual smooth calli obsolete; the elytral punctuation is very coarse, noticeably so in the very obsolete transverse depression. The form of the tibia seems different from any of the allied species—the ♀ probably has more costate elytra. It is probably mixed in collections with *pruinosa*, Lef., which occurs from the same locality and is often the same size.

Colaspis basipenne, sp. nov.

Medium sized; elongate. Chestnut brown, with a metallic green, humeral lateral spot, continuing narrowly around the base and then running down the suture vanishing at the posterior third; joints 6 and 7 of the antennæ dark (10 and 11 missing).

Type, ♂, Cochabamba, Bol. (Germ.).

Length, 7.5 mm.

Head finely punctured with deep transverse and longitudinal grooves; thorax grossly and unevenly punctured with scattered smooth areas and confluent spaces, sides strongly angulate at the middle; scutellum smooth, brown; elytra finely, closely punctured, near the suture in rows or semigeminate series, the interspaces more or less raised and smooth, becoming well developed and regular at the apex; somewhat similar in marking to *cinctella*, Lef., but much larger.

Colaspis dispar, sp. nov.

Medium sized. Below æneous fulvous, shining, tinged with metallic green; above æneous bronzy, shining, with all the edges and punctures coloured with metallic green; antennæ and legs flavous, the former darkened at the tip; the hind tibia of the ♂ slightly curved at the apex.

Types, two ♂, two ♀, Tanampayo, Boliv.

Length, 5-7 mm.

Head rather thickly and coarsely punctured with deep transverse and foveate longitudinal depressions; epistome finely punctured; thorax grossly and unevenly punctate, with scattered smooth areas and confluent punctures, sharply angulate each side at the middle, with sinuate edges before and behind the angle; scutellum smooth; elytral punctuation strong, semigeminate; intervals pretty well defined as smooth areas, becoming strongly costate at rear, where the punctures become simple as usual. I place the species near *tarsata*, Lef., and *amazona*, Jac.

Colaspis otileasis, sp. nov.

Medium sized. Stout below, with the head and thorax greenish æneous, the latter shining, sparsely punctate, sides triangulate; elytra cyaneous blue, tinged with green near the thorax; legs black, except thighs, which are coloured like the underside, and rufous at the base; antennæ very dark fuscous; elytra square at the base with prominent shoulders, each side with eight or nine costæ which become obsolete in the rear; surface finely punctate.

Type, ♀, Chaco, Bolivia.

Length, 7 mm.

Head rather coarsely punctured, front continuous, with a well-marked fovea on the vertex; antennæ more than half the

length of the body, slightly incrassate at tip; thorax broader than long, a well-marked fovea on each side, next the margin, the punctuation sparse and fine except around the fovea; elytra with well-marked shoulder knobs and transverse and post-scutellar depressions, somewhat interrupting the costæ, which, beginning with those next the suture, gradually tone down into smooth interspaces, having the punctures arranged in more or less geminate rows, especially on the rear disc.

The square prominent elytral base and shoulders give this form the appearance of a species of *Otilea* like *fulva*, Jac.

Colaspis brunneipennis, sp. nov.

Rather large and stout. Body below bluish black, above with head, thorax and scutellum æneous black; elytra chocolate brown, both thorax and elytra very narrowly margined with metallic cyaneus; feet, antennæ, labrum and palpi testaceous.

Types, three ♀, Balzabampa, Ecuad, (Haensch).

Length, 6-8 mm.

Head thickly punctate with both transverse and longitudinal grooves and smooth antennal calli; antennæ about half the length of the body, partly fuscous in some examples; thorax strongly transverse, subbidentate on the sides, or unindentate with a sinuation in front; surface grossly and confluent punctate and deeply foveate on each side, just back of the middle; elytra with a very obsolete basal depression, grossly confluent and sub-geminately punctate, with the intervals semicostate or costate at the sides and apex, easily recognised by its colour; ♂ is unknown.

Colaspis peruvianus, sp. nov.

Short, stout, ovate, shining. Above purplish æneous, below with legs cyaneous green or blue; head thickly punctate, faintly impressed; thorax coarsely punctate, sparsely so on the disc, sides strongly angulate at the middle; elytra grossly foveate punctate, semi-seriately arranged, and transversely confluent in places; the longitudinal intervals costulate near the apex and sides; inside of hind tibia of ♂ with a minute spine at apical third.

Type ♂ and ♀, Peru (Callanga?) (second Jac. Coll.).

Length, 4 mm.

The punctuation of the thorax is much coarser than in *chalcites*, the elytra more convex and the punctures much more foveate. It is nearly related to *melancholica*, Jac., from Mexico. This latter, as well as *nigrocyanea*, Cr., both have notched or spined ♂ tibia.

Colaspis 4-foveata, sp. nov.

Size of *subænea*, Jac. Body below cyaneous black, above æneous bronze with a faint greenish tint; thorax wide, strongly

angulate at the middle, thickly and rather heavily punctate, with a few irregular smooth places on the disc, and with four well-marked foveæ placed transversely behind the middle (they show best looking from the front); elytra closely geminate punctate (except next the suture); intervals costate, the alternate ones wider and stronger.

Type, ♀, St. Catharina, Brazil.

Length, 4.5 mm.

Head everywhere thickly punctate; antennæ short, dark, rufous towards the base, the first six joints shining, the rest and the base of the femora more or less rufous. Until the ♂ is seen it is difficult to assign its nearest relative.

Colaspis 12-notata, sp. nov.

Small, spotted, slender, elongate. Body beneath very dark brown, with sides of prothorax red; above, head, thorax and scutellum red with black eyes and jaws; elytra dark, dull, bluish black, each side with six yellowish spots placed 2-2-1-1; legs flavous; upper sides tinged with black.

Type, one ♂, Cochabamba, Boliv. (Germ.), one ♀, Beni R., Boliv.

Length 4.5 mm.

Nearly related to *ornatipennis*, Jac., and possibly a variety of it; antennæ dark brown, base rufous; head very finely punctate, strongly transversely depressed between the eyes, vertex foveate; thorax slightly collared in front, sparsely and finely punctate, sides moderately angulate, sinuate just behind the middle; elytral depression barely showing just below the shoulder, surface punctate striate with smooth intervals at apex; the light spots are arranged two on the disc before and two behind the middle, small and round, not marginal; a larger transverse one near the tip, and the last small, at the extreme apex; easily recognised by the twelve spots.

Colaspis cinctipennis, sp. nov.

Small; spotted, slender, elongate. Body beneath yellow, with abdomen dark brown; head and thorax shining flavous, eyes black; elytra dark, violet plum colour, with a wide sublateral flavous band running from shoulder to shoulder, also on each elytron three spots—a small basal next the shoulder, a larger triangular, a little before the middle, placed so that the base is towards the suture and with the apex joined to the lateral band, and a submedian elongate spot next the suture.

Type, one ♂, Dr. Hahnel, Amazon (Staudinger).

Length, 3 mm.

Nearly allied to my *12-notata*; antennæ relatively long, light brown, rufous at the base; head finely punctate with the usual cross depression; thorax slightly collared, lightly punctate, especially on the disc, sides strongly angulate at the middle; scutellum

dark rufous; elytra semi-regularly punctate striate on the disc, becoming regular at the apex, the punctures stronger on the lateral flavous band; legs pale flavous, with rufescent or darker tarsi. The markings make this form easily known; looked at from above the spots are more noticeable than the band, and all the markings, especially the lateral band, appear smaller.

(To be continued.)

NOTES AND OBSERVATIONS.

DEPRESSARIA AUTOCNISTA, N. SP.—I propose this name for the insect hitherto known as *aspersella*, Const., from South of France. It seems to have been overlooked that Constant's specific name (published in 1888) is preoccupied by *adaspersella*, Koll. (1832), in the same genus; the two names are simply variant spellings (both admissible) of the same word, and cannot be treated as distinct names without probability of confusion.—E. MEYRICK; Thornhanger, Marlborough, January 15th, 1921.

MARGARODES UNIONALIS IN SUSSEX.—Early in October last a specimen of *Margarodes unionalis* was taken at "sugar" by Mr. Thomas Salvage in his garden at Arlington, a village some seven miles inland from this part of the coast, and sent to me for identification. This capture appears to be of some interest when taken in conjunction with those on the Devon Coast reported at p. 20 of this Journal, as showing that the immigration to which they are undoubtedly due must have been of wide range although possibly not large in numbers.—ROBERT ADKIN; Eastbourne.

[This species was first noted as occurring in Britain in 1859. Subsequently odd specimens were recorded from Brighton, Deal, Forest Hill, Gosport, Gravesend, Isle of Wight, Torquay and Tresco. In 1884 a specimen was secured at Gosport on October 23rd. The only records we have any note of between 1884 and 1920 are the following: A specimen taken at a lamp at Boscombe, September 21st, 1900 ('Entom.,' vol. xxxiv, p. 182); one at Hythe, October 27th, 1913 ('Entom.,' vol. xlvi, p. 314); two in South Devon, October 12th and 13th, 1920 (*antea*, p. 20).—ED.]

LIMENITIS SIBYLLA IN WARWICKSHIRE.—On a Saturday evening at the end of the first week in August, 1918, in company with my respected entomological friend, Mr. J. W. Saunt, we were proceeding at precisely 7 p.m. to meet other entomologists to spend a night sugaring, etc., for moths. On approaching our destination, in a narrow defile, Mr. Saunt suddenly made an overhead and backhanded stroke with the net and captured a fly which weakly flew across the path, exclaiming at the same time—"Sibylla." That night, seated round the camp fire, after arousing the curiosity of our assembled friends, I had the pleasure of announcing this important capture. Mr. Saunt proclaimed his intention of liberating the insect at sunrise in the woods, to give it a chance of reproducing its race, for it appeared to be a female insect. Sad to relate this little faded flower

of the air died that night in the box, before it had time to regain its promised liberty. On Sunday, June 29th, 1919, a dull and cloudy morning, not far from the spot above referred to, in the glade of a wood, overgrown with honeysuckle, I was startled by the weak flight of a butterfly overhead. I saw the underside against the light and recognised *Sibylla*. I struck at it and the insect appeared to fall to the ground, I groped about for it amongst the leaves and foliage upon the ground, and just as I was giving up the search I saw something flutter a little, popped a glass-bottomed box over it and secured the prize. It was the first specimen I had caught, or in fact possessed, and only the second I had seen on the wing. It proved to be a male, perfect to a scale. The fortnight following was wet and dull, but on Sunday, July 13th, a warm and sunny morning, when visiting the same spot in company with my brother, we had the good fortune to meet with several more of these butterflies which were flying up and down the glade. I was privileged to secure another specimen, a female this time, in perfect condition, and my brother also obtained one. As a matter of fact, although we possessed only the specimens referred to we had no desire to exterminate it. There were certainly several more flying about when we left, and subsequently Mr. H. Wagstaff, the Secretary of the Coventry Natural History Society, also observed its evolutions on the same spot or near it without attempting its capture. Last year, 1920, I had not the opportunity of visiting the spot owing, firstly, to absence on holiday from July 2nd to 19th, and this, with subsequent bad weather, kept me away till the beginning of August. I did not at that time see it, but I do not despair of seeing it during the coming season, and, I hope, in increased numbers.—E. H. SILLS; "*Sibylla*," Bray's Lane, Coventry, January 14th, 1921.

REARING OF *HYLOICUS PINASTRI* LARVÆ.—In my article on *H. pinastri* in the 'Entomologist,' November, 1919, I stated that all my captures with the exception of two were made on the sunny side of the pine trunks. I made a further effort for this insect last year, working the pine woods at Aldringham and Woodbridge. My captures, sixteen in all, were with one exception on the opposite side of the trunks, plainly showing, owing to the wind blowing on each occasion, that the sheltered side was the favoured one. In 'Practical Hints' I notice it is stated that the larvæ appear easy to rear; my experience has been very much to the opposite. From about 170 ova or more in 1919 I fed up nearly to full size about 150 larvæ: eventually two pupated but no moths emerged. In 1920 I sent living females to several friends. Newman, of Bexley, and myself appear to have been the most successful. I obtained 140 ova, and of these only 23 hatched. When full-fed two larvæ died. Out of the remaining 21 only 8 formed perfect pupæ, and a centipede finished two out of the eight. The remainder mostly attempted the change but formed misshapen pupæ.—E. CRISP; "Heathcote," Heathfield, Sussex.

NEW FOREST HYMENOPTERA ACULEATA (1920).—The following species have been accidentally omitted from my list of above: *Pompilus bicolor*, *P. minutulus*, *P. spissus* (all scarce), *Nomada*

succincta (common), and *Stellis aterrima*. The last insect is represented by a solitary ♀ from a Lymington garden, and is a rather surprising capture, inasmuch that *Osmia*, on which *Stellis* is parasitic, was not once seen here throughout the summer. *Anthiolium manicatum*, however, is common locally and a likely host—possibly merely the *locum tenens*!—HUGH P. JONES; Eastlands, Lymington, Hants.

SCARCITY OF BUTTERFLIES IN GLOUCESTERSHIRE IN 1920.—*Polygonia c-album* did not appear here at all last autumn and I saw but one *Celastrina argiolus* throughout the season, though the latter has previously been abundant here for some years. The only butterfly seen in any numbers during the autumn of 1920 was *Pyrameis atalanta*.—B. A. CONEY; Pucklechurch, Gloucestershire.

EARLY EMERGENCE OF TEPHROSIA CREPUSCULARIA.—On January 23rd I noticed a fine, newly emerged and perfectly developed ♀ of this species in one of my cages, which are kept outdoors throughout the winter. The batch of pupæ from among which this individual emerged were reared from ova laid by a wild ♀ taken from a tree-trunk on July 4th, 1920.—A. T. POSTANS; 148, Fawcett Road, Portsmouth.

PANORPA COMMUNIS, L. (VARIETY).—In connection with examples which ('Entomologist,' liii, p. 255) I referred to an extreme form of var. *aperta*, Lacroix, the author of that name writes saying that he thinks a name is required for the extreme form as well. I therefore name it var. *extincta*.—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames, November 19th, 1920.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—November 11th, 1920.—The President in the Chair.—Mr. A. F. Hemming, F.Z.S., F.E.S., Treasury Chambers, S.W. 1, was elected a member.—Mr. Grosvenor exhibited numerous species of *Limenitis*, *Athyma* and *Neptis* from Thibet and the Hindo-Malay region.—Mr. Newnan, gradations from the dark Rannoch form to the very light southern form of *Polyploca flavicornis*.—Mr. Bunnett, a *Mimas tilia*, with the usual transverse bar reduced to a small triangular discal spot.—Mr. B. S. Williams, a *subradiata* form and a *cæruleopunctata* form of *Rumicia phleas* from Finchley.—Mr. A. A. W. Buckstone, several series of *Hygrochroa syringaria*, bred and inbred from larvæ taken at Wimbledon in 1913, 1915 and 1919 with captured specimens, and read notes on the pairings and broods obtained; he also showed living pupæ and imagines of *Pyrameis atalanta* and full-fed larvæ of *Abraxas grossulariata*.—Dr. Dixey, F.R.S., read a paper on "Sexual Dimorphism," illustrating his remarks with a large number of coloured diagrams and a series of lantern-slides.

Annual Exhibition.—November 25th.—Mr. K. G. Blair, B.A., President, in the Chair.—Mr. G. D. Morison, 100, Fielding Road,

W. 4; Mr. D. Watson, 12, Park Place, Gravesend; Mr. G. W. Young, F.G.S., 20, Grange Road, Barnes; Mr. W. West, 29, Cranfield Road, Brockley; Mr. F. H. and Mr. H. M. Simms, The Farlands, Stourbridge, were elected members.—A short series of *Leptomeris* (*Acidalia*) *immorata* and of *Ino* (*Rhagades*) *globularia* from Sussex were presented to the Society's collection by Mr. F. G. S. Bramwell, of Brighton, and were exhibited.—Lord Rothschild exhibited the series of 1277 specimens of *Abraxas grossulariata*, L., from the British Collection of the Tring Museum. They consisted of the series from the Bright and Gibbs Collections and those collected by himself. The larger number of the more extreme varieties have been bred by the Rev. Gilbert Raynor.—Mr. C. H. Williams exhibited a drawer of varieties of the same species.—Mr. Hy. J. Turner, a large number of extra-European forms of well-known species and species closely allied to those in the European area.—Mr. W. G. Sheldon, his series of about 1400 specimens of *Peronea cristana*, including examples of all the 72 named forms and the type-specimens of 39 of them. He also showed about 250 examples of *Leptogramma literana* and its numerous forms.—Mr. Percy M. Bright, a long series of *Epinephele tithonus* aberrations, including a white suffused form and a gynandromorph, and *Argynnis aglaila* forms, including several magnificent melanic aberrations, and a scaleless specimen with perfect fringes.—Mr. B. W. Adkin, a series of aberrations of *Satyrus semele*, including a male from Kent with four eye-spots on the fore wing.—Mr. T. H. Grosvenor, series of British species which occur in India, including *Papilio machaon*, *Pieris brassicae*, *P. rapae*, *Gonepteryx rhamni*, *Colias hyale*, *Apatura iris*, *Pyrameis cardui*, *Polyommatus icarus*, *Aricia medon*, *Rumicia phlaeas*, etc.—Mr. Pickett, series of aberrations of *Agriades coridon* taken in 1918, 1919 and 1920.—Mr. L. W. Newman, aberrations shown in the different British races of *Melitæa aurinia*; a hybrid of *Selenia bilunaria* and *S. tetralunaria*; *Colias edusa* with one wing bleached; a yellow Cheltenham form of *Gonodontis bidentata*; melanic examples of *Zygæna trifolii*; extreme forms of *ab. varleyata* of *Abraxas grossulariata*, etc.—Mr. Riches, *Cossus ligniperda*, including a specimen with almost black hind wings.—On behalf of Mr. L. A. E. Sabine, Mr. Newman, a long series of the beautiful race of *Polyommatus icarus*, series of the Irish forms of *Epinephele jurtina*, *Rumicia phlaeas*, including *ab. alba*, *E. tithonus*, *L. sinapis*, etc.—Mr. A. A. W. Buckstone, aberrations of *Hipparchia semele*, of many local races.—Rev. Geo. Wheeler, a series of *Melitæa phæbe* from Central Europe, showing a wide range of variation over a limited area.—Mr. C. W. Sperring, aberrations of British Lepidoptera, including *Colias edusa* var. *helice*, minus blotches in border on hind wing, *Brenthis euphrosyne* with striated hind wing, a dull leaden *Agriades coridon*, etc.—Mr. Edelsten, a yellow form of *Cybosia mesomella* and a black and grey *Nisoniades tages* from Chippenham Fen.—Mr. B. S. Williams, a series of the new Finchley form of *Dysstroma* (*Cidaria*) *truncata* and crosses between it and the usual black form.—Mr. A. W. Mera, species and hybrids of the genus *Oporabia*, *O. filigrammaria*, *O. autumnaria*, *O. dilutata* and its pale race *christyi*.—Dr. Leonard Hopper, the rare *Leucania extranea* (*unipuncta*) from Penryn, Cornwall, September, 1920.—Mr. A. E.

Tonge, Royston forms of *Agriades coridon* and aberrations of many British species, including a male melanic of *Boarmia consortaria*, a confluent *Zygæna trifolii*, a male *Agriades thetis* with extra orange lunules on the hind wings, etc.—Mr. L. E. Dunster, bleached *Epinephele jurtina*, *Argynnis aglaia* with white marginal spots, *Aphantopus hyperanthus* ab. *arete*, an *Aricia medon* without orange markings, etc.—Mr. Johnston, aberrations of *Dryas paphia* and *Limenitis sibylla* from the New Forest.—Capt. Riley, the Scilly Islands race of *Epinephele jurtina*, much resembling the southern race *hispulla*.—Mr. H. E. Garrett, aberrations of British Lepidoptera, including *Rumicia phlæas* with confluent spots on fore wing, *Euchloë cardamines* with dark hind margins to fore wings, etc.—Mr. H. J. Turner, two coloured plates folio with figures of the larvæ of *Eupithecia assimidata* and *E. abbreviata*.—Prof. Poulton, F.R.S., a series of butterflies captured migrating from one valley to another and back again next morning, with their mimics, in Selangor. They were captured in March, 1920, and were *Delias* species, the mimics being *Euschema* species. On behalf of Mr. J. J. Joicey, Mr. G. Talbot, a large number of new and little-known Lepidoptera from Central Ceram, Dutch New Guinea, French Guiana, Hainan Island, Peru and Brazil, with many striking and brilliant species, and a long series of aberrations of British Lepidoptera, including a gynandromorph of *Pieris napi*, *Colibas edusa* ♀ with left fore wing ab. *helice*, with asymmetrical, unicolorous, streaked and melanic aberrations of varied series.—Messrs. O. R. and A. de B. Goodman, a set of series of British butterflies showing gradation of coloration and markings, and an American Hesperid, *H. syrichtus*, from Surrey; also varied series of butterflies taken in July, 1920, in the Rhone Valley and around Courmayeur, Italy.—Mr. S. Edwards, mimetic species of *Papilio* and species of *Parthenos*.—Mr. Douglas H. Pearson, a large number of species and forms taken by him in the Pyrenees, including very dark ♀ *Melitæa didyma*, the ab. *cleodoxa* form of *Argynnis cydippe*, *Parnassius apollo*, *Cænonympha ædipus*, upper wing unspotted, *Lampides baticus*, *Erebia lefebvrei*, *E. manto* race *cecilia*, *Heteropterus morpheus*, etc.—Mr. Robt. Adkin, the black ab. *chrysanthemi* form of *Zygæna filipendulæ* bred from a Lancashire larva, and *Melitæa cinxia* with intensified markings.—Mr. L. Tatchell, a photograph of a gynandromorph *Amorpha populi* from a Wanstead larva, larvæ of *Dysstroma truncata*, and reported the pairing of a ♂ *Sphinx ligustri* with a ♀ *Smerinthus ocellatus*.—Mr. K. G. Blair, on behalf of Dr. Gahan, a larva of a *Nemopteron*, sp., from Syria, always found in dens on sand.—Mr. Jackson, a mixed gynandromorph of *Cosmotriche potatoria* bred from Oxford.—Mr. F. W. Edwards, a pair of the rare British gnat *Orthopodomyia pulchripalpis* reared from larvæ from Epping Forest.—Mr. Bowman, a series of the forms of *Cosymbia pendularia* recently reared by him, especially ab. *nigro-subroseata*, in varied series of seven subordinate forms.—HY. J. TURNER, *Hon. Editor of Proceedings*.

[Report received January 24th, 1921.—Ed.]

EXCHANGE.

The multiplication of N times of k solutions of $\nabla_{\text{Euler}}^2 \varphi = 0$ is

[illegible]

To CORRESPONDENTS: Manuscripts, papers, books for review, and notices of Exchange should be sent to the Editor.

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-
BURY, N.W. 2.

MEETINGS OF SOCIETIES

ENTOMOLOGICAL SOCIETY OF LONDON, 11, QUEEN'S GATE, SW7 2UH, LONDON, S.W. 7. *March 2nd and 10th at 5 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. HUGH CHAMBERS, London Bridge, S.E. 1. Ordinary Meetings, *Thursdays*, March 10th and 24th, at 7 p.m. Hon. Sec., STANLEY EDWARDS, 11, St. Andrew's Church, 9, St. Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY. Lect. meet. in Hall 30, Windsor House, Old Broad Street, E.C. 2, at 6.30 p.m. Field Society meetings are held on the first *Tuesday* in each month, and Sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings. Hon. Sec., W. E. Green, 44, Ballast Road, N. 16.

CONTENTS.

Some Notes on Rearing *Peribia epiphora*, The late J. Alderson, 57. Notes on the Variation of *Peronea cristana*, Fab., with Descriptions of Six New Forms, and the Reasons for Sinking the Names at Present in Use of Six Others, W. G. Sheldon, F.Z.S., F.E.S. (continued from p. 39), 64. The Heteroptera of Indo-China, W. L. Distant (continued from p. 44), 68. New Forest Notes and Captures, 1920, Hugh P. Jones (continued from p. 48), 70. South American Emodiada, mostly of the Group *Colaspini*, Fred C. Bondatch (continued from p. 30), 72.

NOTES AND OBSERVATIONS.—*Depressaria autemista*, n. sp., E. Meyrick, 76. *Margarodes ammonalis* in Sussex, Robert Adkin, 76. *Limenitis sibylla* in Warwickshire, E. H. Sills, 76. Rearing of *Hyloicus pinastri* larvae, E. Crisp, 77. New Forest Hymenoptera aculeata (1920), Hugh P. Jones, 77. Scarcity of Butterflies in Gloucestershire in 1920, B. A. Coney, 78. Early Emergence of *Tephrocampa crepuscularia*, J. P. L. Goss, 78. *Panorpa communis*, L. (Variety), W. E. Lucas, 78.

SOCIETIES.—The South London Entomological and Natural History Society, 78.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

CABINETS.

Finest Materials. Best Workmanship.

Any size made to order.

Drawing on application.

PUPÆ.

Convoluti	5d. each	Elpenor	5d. each	Batis	3d. each
Ocellatus	5d.	Euciformis	10d. ..	Dersa	3d. ..
Tilia	4d.	Fagi	1 1 ..	Orion	6d. ..
Populi	3d. ..	Albi	1 9 ..	Carpini	5d. ..
Porcellus	1 ..	Carmelita	1 3 ..	Menthastri	3d. ..

Box and Postage 4d. extra.

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

APRIL 1921.

[No. 695.

TELE

ENTOMOLOGIST

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND BROWN, M.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c.

DR. T. SHARP, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U.

N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S.

M. G. SHELTON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST-NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS.

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also
Birds' Eggs

including such rarities as the "Imperial" collection

and also a large stock of the "Imperial" collection of the "Imperial" collection

36, Strand, London, W.C. 2.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Vol. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2

of Congress
APR 10 1921
Smithsonian Deposit

THE ENTOMOLOGIST.

Vol. LIV.]

APRIL, 1921.

[No. 695

FOSSIL TIPULIDÆ FROM THE OLIGOCENE OF THE ISLE OF WIGHT.

By T. D. A. COCKERELL AND F. H. HAINES.

THE Tipulidæ now described were collected in the Bembridge beds at Gurnet Bay, Isle of Wight, and we are indebted to Dr. A. S. Woodward, of the British Museum, and Mr. R. W. Hooley, of Winchester, for permission to study and describe them. The Hooley Collection is at present deposited in the British Museum (Natural History). All the specimens now described were apparently collected by the late Mr. a'Court Smith, of Gurnet or Gurnard, Isle of Wight. He was the discoverer of the deposit, and his materials eventually found their way into the British Museum and the collections of Brodie, Hooley and Lacoe. Those from the last-mentioned collection are now in the United States National Museum; the others are in the British Museum, the Hooley Collection, on loan, with the understanding that the types will eventually become the property of the Museum.*

The most interesting species in the series now described is the *Macromastix*, representing a genus known living (with several species) only from Australia and New Zealand. It was recognised from our figure by Mr. F. W. Edwards, to whom we are greatly indebted for advice, and for access to literature and the collection of Tipulidæ at the Museum. The *Styringomyia* is also very interesting, the genus having first been known from amber and copal, and only in more recent years detected in the living fauna.

The genera of Tipulidæ found fossil in the Gurnet Bay material, but not here discussed, are: *Megistocera*, *Gymnastes*, *Empeda* (2 spp.), *Epiphragma*, *Limnobia*, *Mongoma* (2 spp.), *Atarba*, and *Rhipidia*. There are also additional species of *Tipula* (4), *Gonomyia* (3), *Limnophila* (3), *Dicranomyia* and *Styringomyia*.

* E. J. a'Court Smith was born in Buckinghamshire in 1814. When about 14 or 15 years of age he was wrecked on the Island of South Georgia, and was not able to get away for seventeen months. For many years he was a sailor (officer) in the service of the East India Company, and when the charter of the Company expired he served in the West Indian mail-boats. He was in the Crimean war. In 1859 he retired, and after a long residence in the Isle of Wight died in 1900. He corresponded with Ruskin, who presented him with a copy of Lindley and Hutton's 'Fossil Flora of Great Britain.' We are indebted to his sons, living at Yarmouth, Isle of Wight, for these particulars. It is greatly to be regretted that Mr. a'Court Smith did not live to see his splendid collections described.

Tipula hooleyi, n. sp.

Wing 21 mm. long and 6 mm. broad, hyaline with pale veins, but the end of costal and first marginal cells and the small second marginal broadly pale coffee brown; auxiliary vein joining R_1 at level of base of discal cell, about 15 mm. from base of wing; second marginal cell small, elongate kite-shaped, giving off an apparent cross-vein (really first part of first branch of R_{2+3}) before its middle below; two submarginal cells, the second extending considerably beyond the first at either end; discal cell elongate, five-sided, the two upper sides together forming a low arch, the side on third posterior cell equal to that on second basal, and considerably less than that on first basal; upper branch of fourth vein broadly forked, the cell thus formed about four times as long as its stem; fifth posterior distinctly contracted apically, its basal angle considerably produced.

Hooley Collection, 49. Among the Gurnet Bay fossils nearest to *T. limiformis*, Ckll., but with the basal corner of fifth posterior cell more produced. The fifth posterior cell is shaped practically as in the modern (much smaller) species *T. vernalis*.

The modern *T. lutescens*, which has a similar stigmatic spot, has the discal cross-vein much nearer base of discal cell.

When first preparing these descriptions we had used the old term "subcostal vein" for the so-called first vein of Schiner and Verrall. It seems better to refer to it as R_1 (first branch of radius), as the auxiliary vein is the true subcostal. The "second" vein is the R_{2+3} , and the "third" R_{4+5} . The fourth is the media (*M*), and the fifth the cubitus (*Cu*).

Holorusia vasifera, n. sp.

Length of wing 23 mm., breadth 6 mm., with a brownish tinge, immaculate, without stigmatic spot. Auxiliary vein joining R_1 at three-fifths of the length of the wing; R_1 joining costa at about four-fifths. Præfurca rising at a little beyond middle of wing almost opposite base of discal cell. The upper branch of the second (R_2) leaves the lower at rather beyond its middle, itself joining the costa a short distance beyond R_1 ; the marginal cross-vein is strongly rejected and comes off just beyond the furcation, joining R_1 at a distance from the costa rather more than its own length. The strongly-arched lower branch of the second vein (R_3), which is more than double the upper, joins the costa far before the apex. First marginal cell long and narrow, five times the length of the second; first sub-marginal very much broader than in *Tipula hooleyi*. The third vein ($R_4 + 5$) curves to the tip of the wing. Discal cell five-sided, rather egg-shaped, 2.5 mm. long, the facet on the first basal about double length of that on the second. Petiole of discal fork about one-fifth length of its upper branch, the branches diverging in a wide curve; the simple branch from the lower apical angle strongly curved so that the third posterior is somewhat contracted. Upper branch of postical fork almost parallel with lower, the fifth posterior cell being somewhat rectangular, not at all contracted apically, the

apex of the lower branch of the postical fork rather markedly curved near its apex; anal vein slightly curved, forming a narrow anal cell which is not very far open. Axillary vein and anal angle normal for *Tipula*.

Hooley Collection, 9. Mr. Edwards points out that this should go in *Holorusia* rather than *Tipula*, on account of the expanded or vasiform second submarginal cell.



H49: *Tipula hooleyi*.



H9: *Holorusia vasifera*.



H1398: *Adelphomyia disjunctula*.



I9213: *Limnophila cyclospila*.



I9146: *Dicranomyia undulata*.



I9946: *Dicranomyia excavata*.



I9087: *Gonomyia indecisa*.



H261: *Styrgomyia extensa*.



I10397: *Macromastix cladoptera*.

Adelphomyia disjunctula, n. sp.

Wing 8.5 mm. long, 3.2 mm. broad, hyaline, with a rather strong yellowish tint; veins testaceous, minutely hairy; costa with fine black hairs, subcostal vein much more densely hairy than the other longitudinal veins; axillary vein (*Sc*) ending rather obtusely in the costa beyond middle of wing, at about level of base of discal cell; R_1 ending abruptly nearly opposite middle of upper branch of second vein (R_2), not approaching costa, but connected with R_2 by a pale, hairless, somewhat oblique cross-vein. Præfurca originating about two-fifths of wing length from base, directed downward at its origin, but soon curving outward and taking a very straight course to level of end of axillary vein, when it forms a very wide fork, the upper

division of which ($R_2 + 3$) soon forks again, forming a very long cell, the apex of lower side of which is not far from tip of wing. Discal cross-vein at base of discal cell; first posterior cell not much shorter than second submarginal; discal cell six-sided, narrowed to the squarely truncate base, which is shorter than its side on the second basal; its upper apical face distinctly shorter than its lower; upper branch of fourth vein (M) with a broad fork forming a cell which is about twice as long as its stem. Apex of second basal cell forming a right angle and projected beyond first basal nearly half length of discal cell. Anal vein running close to the fifth for a considerable distance, then diverging somewhat from it. Axillary vein with a double curve, the second only moderately strong. End of axillary vein some distance basal of origin of præfurca.

Hooley Collection, 1398. Resembles *A. cayuga*, Alex., but has first branch of media forked as in *A. americana*, Alex., and is peculiar for the failure of R_1 to reach the costal margin. The discal cell is unusually short and high.

(To be continued.)

EFFECT OF THE EARLY SPRING OF 1920 ON BRITISH LEPIDOPTERA.

By A. W. MERA.

PERHAPS it would be as well before touching the Lepidoptera of the season to give a few details respecting the dates on which one or two of our common trees put forth their foliage in 1920 as compared with the three years before. These dates refer to the Epping Forest district.

OAKS.—(1) 1917: On May 6th the Forest was bare; by the 13th it had burst into leaf. (2) 1918: On April 28th were just bursting into leaf. (3) 1919: On May 2nd still bare, by the 15th were out, summer weather. (4) 1920: On April 14th a few trees in leaf.

BEECHES.—(1) 1917: On May 6th, on high ground only, a few trees in young leaf. (2) 1918: April 28th, just breaking into leaf. (3) 1919: May 1st, slightly leafy in places. (4) 1920: April 14th, in leaf.

BLACKTHORN.—(1) 1917: May 6th, just coming into bloom, and in full bloom by May 13th. (2) 1918: March 31st, some bushes out; in perfection by April 7th. (3) 1919: May 2nd, just out; by May 15th still out, but getting over. (4) 1920: March 11th, several bushes in blossom, and fully out on March 30th.

The Whitethorns were out particularly early, as I saw a few sprays of blossom as early as April 14th, although the bushes were not in full beauty until May 9th; but with this tree I had made no previous notes for reliable comparison.

By these dates it will be seen that this year was a particularly early season as regards vegetation, and it would appear that the

effect on Lepidoptera was hardly so pronounced as might have been expected. In no way can the season of 1920 be compared to the early season of 1893, when insects raced along, and in many cases were much dwarfed in consequence. In the present season things seem to have been equalised by the very sudden changes of temperature which were experienced. On May 25th, when the thermometer reached 81°, the summer seemed to have spent itself in a few days, after which we were subjected to occasional night frosts well into June. I was on the borders of Dartmoor during the second week of June, and there I saw that the young bracken had been blackened by frost, and again in Essex at North Weald on July 3rd much the same thing was to be seen, only that the bracken was of much older growth before being frosted. Some of the spring larvæ were early. *Hybernia defoliaria* was full grown by May 15. In Monks Wood the larvæ of *Thecla pruni* were about the same size as at the same date last year, and *Zephyrus betulæ* were slightly larger, while *Trichiura cratægi* were smaller than in 1919. Generally speaking larvæ were scarce. By May 25th in Epping Forest the common Hybernidae larvæ were nearly over, and what were left were mostly ichneumoned.

Of the very early spring Geometers I have no unusually early dates to record, although there are records of *Phigalia pedaria* (*pilosaria*) appearing as early as the middle of January in the north of England. The first I saw was on February 1st at Chingford; the first *H. leucophearia* on February 6th at Crawley Down; *Apocheima hispidaria* on February 8th at East Grinstead. *B. strataria* was taken at Loughton on April 21st and *Tenio-campa gothica* on May 5th at Bexley Heath, both of which are really late dates. I picked up a fine specimen of *Cymatophora ocularis* at Loughton on May 30th, which perhaps is somewhat early, and also *X. fluctuata* on April 19th, also early.

Commencing with the Pieridæ, there were one or two remarkably early records of *Pieris rapæ* in the 'Entomologist,' but the first one that I saw flying was not until April 25th, which of course is rather late than otherwise. In fact the species was not really numerous until May 9th. The other two "Whites" were in their usual abundance, but perhaps not in sufficient numbers to call forth any special comment, unless it was an unusually prolific second brood of *P. brassicæ* in early August at Loughton. There were also some very early records of *Euchloë cardamines* in the 'Entomologist,' but personally I saw nothing to call for special notice. Hibernated *Gonepteryx rhamni* were seen on May 15th by me, but as I have only seen one specimen during the autumn it would appear that the weather proved unsuitable for them. I have seen *Colias edusa* very sparingly at a quite normal date on August 14th at Mayfield, Sussex. As to the Fritillaries, those that I have met with have been out at about

their usual dates. In South Devon *Brenthis euphrosyne* was seen on June 9th in fairly good condition, and *B. selene* on June 9th and 10th in fine condition. *Argynnis adippe* I saw flying in a wood in Essex from July 8th to 13th, which dates are quite normal. The season has been very favourable to some of the Vanessidæ, particularly for *Pyrameis atalanta*. The first which I saw was on March 1st at Mucking, but as I was unable to catch it I am not able to state its condition. I saw specimens on June 7th and 23rd at Loughton, on July 8th at Wrabness, Essex (worn), on July 16th (very worn) at Loughton, and on July 17th (perfectly fresh), Loughton, and from July 31st onwards in abundance. Up to July 17th all the early specimens showed signs of old age. Personally I am not at all satisfied with the more recent idea that *P. atalanta* does not hibernate in this country. Certainly by the appearance of most of the early ones they must have hibernated somewhere. However disastrous the season may have proved to many species of Lepidoptera *P. atalanta* has flourished exceedingly.

I saw *P. cardui* on May 15th in Monk's Wood, Huntingdonshire, and also at Herne Bay on June 23rd, both apparently worn, but fresh autumn specimens, as far as I have seen, have been decidedly scarce, as I have only seen one, and that was in Buckinghamshire on August 25th. However, I hear from other entomologists that it has been quite common in places. *Vanessa io* I have met with generally, and at normal dates. *Aglais urticae* has been comparatively scarce, but I have seen a few both at Loughton and in Sussex. *Limenitis sibylla* I took in Essex from July 8th to 13th; by the last date it was almost over. Among the Satyriidæ *Pararge megæra* turned up about the usual dates and in fair numbers. Some few years ago Prof. Meldola remarked in the 'Entomologist' how the Satyriidæ were gradually disappearing, particularly from the vicinity of towns, which fact was endorsed by most field entomologists. His reference was chiefly connected with *megæra*, saying that, when a boy, this insect was seen every year in his garden at Leyton, and that it had long since disappeared for miles round Leyton. For some unaccountable reason this insect, for the last few years, has become decidedly more common again. Last year I saw one at Loughton for the first time after six years' residence in the district, and this year I saw it at Crawley Down in Sussex, where I had never seen it before, although I have been to the same place at the right time for at least the last ten years. I also took the insect in fair numbers at Mayfield in Sussex. The dates of appearance were normal. *P. egeria (egerides)* has also been fairly abundant in its more or less restricted haunts. I took it in Devonshire in June, and again on the Chilterns in August, which dates also are quite usual. *Epinephele tithonus* has also shown up well this season. It was on the wing for a long time. The

first I took was on July 8th at Mistley, Essex. After that I saw it at Crawley Down, Sussex, from August 6th to 18th, in good condition, and many of them struck me as being particularly large. The last dates are somewhat late for fresh specimens. They were undoubtedly in much larger numbers than I had ever seen them before in the same district. *Aphantopus hyperanthus* was also out for a long time. The first I took was on June 23rd at Blean Wood, Kent. After that it was abundant in Essex from July 8th to 13th, when it was getting wasted, and the last I saw was on August 6th at Crawley Down. This species I should say had been hurried up by the early season, in spite of the one late record. *E. jurtina* was out early. The first observed by me was on June 11th in Devonshire, and the first at Loughton was on June 22nd. It was still flying in a wasted condition at Crawley Down when I left on August 18th. On August 7th, and on the 13th, I took two perfectly clean specimens which contrasted in a very pronounced manner with the other more or less worn specimens flying round. These have all the appearance of a second brood. I see in South's 'British Butterflies' that it has been suggested before that the late clean specimens are possibly the result of a second brood, but that no direct evidence has been produced to prove it.

With the *Lycenidæ* my observations were greatly hindered by bad weather. It has certainly been a great year for *Chrysophanus phlæas*. There was a second brood out by July 11th at Mistley, and during August and September they have been in evidence wherever I have been. *Polyommatus icarus* has been abundant also, but I have no unusual dates to record. The few *Agriades corydon* that I have seen would lead me to suppose that the species was not earlier than usual. I saw a fairly fresh specimen at Oxted on August 10th, and also a few fresh specimens on the Chilterns on August 25th, but on both these excursions the weather was against me. With the *Hesperiidæ* I saw *H. malvæ* on May 22nd, and as late as June 22nd at Loughton, and I saw this species in Devonshire on June 10th and 11th. These are certainly not early records. *A. sylvanus* was seen by me on June 11th in Devonshire and on June 22nd at Loughton, and as late as August 8th at Crawley Down. *A. flava* was seen in Essex on July 14th, and at Crawley Down from August 6th to 18th, which is rather late than otherwise.

Finally, I should say that moths generally have been particularly scarce, but as I have been unable to carry out much night work I am hardly in a position to judge. However, it appeared to me that remarkably few Geometers were disturbed during my day rambles. The only time I tried ivy was on October 11th. It was a beautiful clump of blossom about two miles from Loughton, fully out, and to all appearance a favourable night, but the only insect that was beaten out was one *Plusia gamma*!

NEW FOREST NOTES AND CAPTURES, 1920.

BY HUGH P. JONES.

(Continued from p. 71.)

Geotrupes pyrenæus, *Elatér sanguinolentus*, *lythropterus*, *elongatus* and *balteatus*. *Lampyris noctiluca* (the rain having little effect on the "glow-worm's" light, which, however, was not so much in evidence this year); *Callideum violaceum* and *C. variabile*, *Clytus arietis* and *C. mysticus*, *Rhagium bifasciatum*, *indigator* and *inquisitor*, *Necydalis* (*Molorchus*) *umbellatarum*, *Leiopus nebulosus*, *Prionus coriarius*. Also a few other "long-horns" requiring verification.

LEPIDOPTERA.—Moths seemed up to their usual numbers in June. *D. orion* was taken not uncommonly, I heard, but is scarce directly south of Brockenhurst—unfortunately my "sugar-ing" ground! Spring larvæ were quite abundant in some enclosures, but I failed to beat *Z. quercus* anywhere but at Royden, where a dozen or so will occur on one tree, and perhaps no others within a considerable radius. *Hemaris fuciformis* and *H. tityus* were common in May, notably at Wood Fidley, where the former kept to the woods, its congener preferring the rides or the open spaces by the railway. For the purpose of obtaining eggs *in situ* I followed up a ♀ *tityus*, and found that she was not at all particular in her ovipositing, blades of grass, etc., being chosen quite as frequently as the food plant. Extrusion of the egg was quite a lengthy matter, the insect fairly sitting down to the work. Unfortunately, when I visited the same ground in August, wood-carts had been all over the place to avoid the mud in "drives." During the end of June, and a couple of fine days in July, I secured a fair number of minor forms of *L. sibylla* and *D. paphia*. Only one good *nigrina* intermediate of the former was taken, but in August I saw two others which were too worn for keeping, so left them to carry on the race (although probably most of the eggs had been deposited by that date). *Colias edusa* was common at Milford-on-Sea in August (as, I hear, all along the coast), a rather surprising circumstance considering the havoc the rain must have caused amongst the larvæ. I did a lot of "beating" for autumn forest larvæ, but took practically nothing, and had the same result at "sugar." *Catocala sponsa* was about the only visitor at Royden in July, where, finding that I was wasting expensive "treacle," I only painted six trees at long intervals, instead of the usual score or so, and found they produced just as good—or rather poor!—results.

ODONATA, ETC.—These were scarce after the rains. I found *Anax imperator* very plentiful in enclosures during June. *Brachytron pratense* turned up at Royden, where I also took *Cordelia ænea*. I am pretty certain that I saw *Gomphus vulgarissimus* near Setthorns enclosure, but most unfortunately missed

it. *Æschna cyanea* was unusually scarce, and the heavy rains in July brought *Calopteryx virgo* to a very premature finish. Amongst other *Neuroptera* taken was the curious "snake-fly" (*Raphidia*). A few *Osmylus chrysops* (one at "sugar"), and a single *Nothochrysa capitata* (from G. Gulliver). With *Orthoptera* I did little. The "wood-cricket," *Nemobius sylvestris*, was plentiful by the side of rides in enclosures, together with *Tetrix bipunctatus*, and I turned up a few of the very fine bog "grass-hopper," *Mecostethus grossus*, at Denny Bog, and Norley Wood. Good "Longhorns" (*Locustodea*) were scarce. *Locusta* (*Phasgonura*) *viridissima* was not seen.

In a quiet little way it has been quite a *Cicadetta montana* year. Ramnore is the best-known place for this interesting insect, but it extends for several miles beyond that spot, as well as occurring in another locality. My first specimen was taken on June 5th, and after the lapse of a week several more were found (one in a collector's killing bottle!), and they continued to appear until the end of the month, empty nymph cases being fairly frequent. One hot morning they flew very wildly, but I obtained all I required from the ground, where, probably recently emerged, they attracted attention by a peculiar rustling sound, very similar to the noise made by the larger "dragon-flies" when resuming flight after a rest. For this reason *Anax imperator* frequently deceived me into thinking that *Cicadetta* was about.

Eastlands,
Lymington,
Hants.

LEPIDOPTERA IN PERTHSHIRE, 1920.

By F. G. WHITTLE.

EARLY in April I spent a week at Struan, where *Nyssia lapponaria* occurred sparingly over a wide area. From ova obtained I secured a healthy brood of larvæ, which did well on *Myrica*, and duly pupated. From Struan I went to Forres, and in one of the numerous clearings in the Altyre Woods netted, April 17th, *Evetria logæa* (*duplana*), Drnt. That interesting beetle *Thanasimus formicarius* was found on a pine trunk May 6th; *Eupithecia albipunctata* and full-grown larvæ of *Ortholitha plumbaria* on tops of *Ulex* on 7th; on 12th *Mamestra glauca* emerged (Rannoch larva). I left Forres for Rothiemurchus, and found, in plenty, the resinous nodules of *Evetria resinella*. *Evetria logæa*, Drnt., also occurred on ground very similar to that on which I took the species near Forres. A few days after this a disastrous fire swept over this spot, and must have been very destructive of bird and insect life. *Thera cognata* larvæ and pupæ of *Argyresthia arceuthina* were found on juniper on May 17th; *Stigmonota dorsana* occurred on *Lathyrus montana*, var. *tenuifolia*, near the

path to Braemar, between Coylum Bridge and Alltduie, on June 3rd, and *Eupithecia helveticaria* on fences; *Eucymatoge togata* was netted among spruce; on 10th *Epitheatia lathyri* and *Gelechia solutella*, the latter in plenty, variable and in fine condition; on 17th, larvæ of *Plastenis subtusa* between aspen leaves, and *Hepialus fusconebulosa*, ab. *gallicus*; on 28th, a single example of *Cemiostoma susinella*, flying among aspen, and *Lithocolletis heegeriella*. I wanted to spend a week or so at Blair Atholl for Glen Tilt, but found it so difficult to get suitable accommodation that I gladly accepted the offer of the one-roomed bungalow annexe to the Struan Inn, and was made most comfortable. I found, on July 2nd, a larva of *Aporophyla nigra*; on 4th a few *Gelechia acuminatella*; on 7th, in a lane by the side of the Tilt, larvæ in hundreds of *Epermenia chærophyllella* on *Heracleum*; on 14th *Elachista bedellella*; on 15th *Perittia obscuripunctella* flying in some numbers up and down a wall that seemed to be bare of honeysuckle; on 19th, in Glen Tilt, *Ablabia argentana* and *Pselinophorus brachydactylus*. I looked for, but failed to find, the food-plant of the Plume. *Crambus myellus* was beaten out near the Tilt on the 21st. *Coleophora discordella* was taken near Struan Point on August 10th; *Zelleria saxifragæ* occurred on *Saxifraga aizoides*; on 22nd *Depressaria pulcherrimella* occurred; on 28th, to my delight, through the kindness of a young friend, a fine example of *Crymodes exulis*, var. *assimilis*. Willie McIntosh, of Kirkcaldy, who, with some of his relatives, was making ready for tea in the open, noticed that a moth was crawling away from a stone near which a fire was burning. He quickly gave it shelter in a match-box, when it did what is not always done in such cases—it settled down quietly, and reached me in faultless condition. *Plutella dalella* occurred September 9th on fences at Struan; that handsome and scarce Longicorn, *Saperda scalaris*, and *Phibalapteryx lapidata*, occurred on the 24th. After this things got so hopelessly bad that I returned home to find Southend revelling in sunshine such as I had not experienced during my six months' absence in Scotland.

7, Marine Avenue,
Southend-on-Sea.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 12.)

NOCTUIDÆ.

ACRONYCTINÆ.

Acronycta leporina.—A long series of ab. *bradyporina*, Tr., from various localities. A very dark specimen ab. *melanocephala*,

Mansbridge, from North Staffs. There are three specimens without data of true *leporina*, one from the Hope and two from the Spilsbury Collections.

A. aceris.—A specimen of ab. *infuscata*, Haw., from the Spilsbury Collection, without data.

A. alni.—Series of 25, 13 of them with data. One from the Hope Collection is labelled with a reference to the 'Entomologist Intelligencer' of 1856, p. 108. Three N. Staffs bred specimens show a decided tendency towards melanism.

A. strigosa.—Series of 22. Two are labelled "Cambridge Fens, July, 1890, presented by W. Holland." Another from the Meldola Collection is labelled "Cambridge," but without a date.

A. auricoma.—Six specimens. One from the Meldola Collection is labelled "Sussex, 1894."

A. rumicis.—Two specimens of ab. *salicis* from N. Staffs, and one from Yorks from the Sellon Collection.

A. ligustri.—Series of upwards of 30, mostly with full data. Three ab. *coronula* taken near Oxford, from the Pogson Smith Collection, and one without data from the Hope Collection.

Arsilonche albovenosa.—Nineteen specimens. Six labelled "Cambridge." The rest without any data.

Bryophila perla.—Series of more than 100 with full data, among them a very beautiful yellow specimen taken in the Isle of Wight by the late Capt. R. W. Poulton. A series of more than 20 from the Meldola Collection, from various parts of Scotland, are larger and more strongly marked than the average of English specimens.

B. muralis.—A long and very varied series with full data from S. Devon, Wiltshire, Isle of Wight and Sussex.

B. impar.—Six specimens from Cambridge presented by Mr. J. Peed.

TRIFINÆ.

Agrotis segetum.—A long series with some fine aberrations.

A. vestigialis.—In the series are eight specimens taken near Oxford, at an inland locality in which it regularly occurs. They differ slightly from the type.

A. cinerea.—A very varied series of about 40, all but one males. Two specimens from Wyre Forest have a brownish ground colour.

A. cursoria, *A. nigricans*, *A. tritici*, *A. aquilina*, *A. exclamationis*, *A. upsilon*, *A. ripæ*.—Long series of each of these species exhibiting almost every form of variation.

A. obelisca.—Series of 40 from Devon, Isle of Wight and Purbeck.

A. præcox.—Series of 34, 17 with data, from the Isle of Wight, Cheshire and Lancashire.

A. simulans.—Seventeen specimens. Six from the Meldola Collection with data, viz. 4 Aberdeen, 1 E. Lothian, 1 Portland. The others without data.

A. agathina.—Series of 50 from Somerset, Dorset, Hants, Surrey and Carnarvonshire.

A. obscura.—About 30—6 Oxford, 3 Yorks, 3 Essex. The rest without data.

A. hyperborea.—A varied series with full data. Twenty-three from Rannoch, 1 from Shetland.

A. ashworthii.—Twenty-eight from Penmaenmawr with full data. Nine without data from the Hope and Spilsbury Collections. One of the Hope specimens is labelled "H. Doubleday."

Noctua subrosea.—Twelve specimens. Three or four of them are in bad condition; the rest more or less worn.

N. flammata.—A specimen from the Sellon Collection labelled "Cummings Collection."

A. glareosa.—A long series from many localities in England and Scotland.

N. castanea.—A long series of grey and red forms, both English and Scotch. There are two specimens of a pale ochreous yellow approaching var. *xanthe*, Wfdé., both from the Burnt Woods, N. Staffs. One was presented to the Collection by the Rev. G. Hughes, the other by the Rev. C. F. Thornehill.

N. depuncta.—Fifteen specimens, but only three have data. One from near Reading, taken by Mr. W. Holland. Another from the Meldola Collection labelled "Exeter, 29.7.02." A third from Forres.

N. ditrapezium.—Twelve with data. Four of them from Brighton; the others from Scotch localities.

N. primulae.—A long series from English localities. Twenty-nine var. *conflua* from Aberdeenshire, Ross-shire and Nairn. Two var. *thulei* from Shetland, presented by Commander J. J. Walker.

N. dahlii.—Series of 8 from the New Forest, 12 from N. Staffs, 22 from various Scotch localities.

N. sobrina.—Series of 20 from Aberdeenshire.

Triphæna orbona (*subseque*).—Series of 30 with full data from Dorset, the New Forest and Canterbury.

T. comes.—A long series, including more than 20 of the dark Scotch forms. A remarkably fine specimen of var. *rufa*, Tutt, taken by myself in N. Staffs, is as dark as any Scotch example.

Eurois occulta.—Fifteen specimens from Scotland with full data. Two taken in Essex, August, 1869, from the Meldola Collection, are recorded in the 'Entomologist,' vol. iv, p. 325.

Aplecta tincta.—A fine series with full data, mostly from N. Staffs and Scotland.

A. nebulosa.—A long and very varied series. Eight ab. *robsoni*, 4 of which were presented to the Collection by Mr. B. H. Crabtree and 4 by Messrs. Main and Harrison. Four ab. *thompsoni* were also presented by Messrs. Main & Harrison and 1 by Mr. B. H. Crabtree.

Mamestra contigua.—Ten with full data from Surrey, from the Champion Collection. A very fine dark specimen labelled "Rannoch" from the Tautz Collection (bought at Stevens).

M. glauca.—Seven with full data from Staffordshire. Twenty from various Scotch localities; 6 of them, from Aberdeen, presented by Mr. A. Horne.

Dianthæcia barrettii.—A very varied series of over 50 with full data. Of these 23 were bred by myself from larvæ found in the Bude district on *Silene maritima*, and 16, also bred by myself, from larvæ found on *S. maritima* in S. Devon. Five specimens from S. Ireland bred by Mr. L. W. Newman. One of the Bude specimens has a distinctly ochreous tinge.

D. cæsia.—Series of 19, 12 with data, from Douglas, Isle of Man.

D. conspersa.—Series of over 50 from various localities in England, Wales and Scotland, with full data. Two specimens in a series of 10 bred from Carnarvonshire larvæ approach the dark Shetland form *hethlandica*, Staud., of which last there are 5.

D. albimacula.—Eighteen with data; 16 from Folkestone, 2 from S. Devon.

D. carpophaga.—A fairly long and varied series with full data. Twelve ab. *capsophila* from the Isle of Man.

Dianthæcia irregularis.—Five from Cambridge, presented by Mr. E. D. Bostock. Twelve from Suffolk, presented by Mr. B. H. Crabtree.

Hecatera chrysozona.—Nineteen specimens, but only one with full data. This is from the Meldola Collection, and labelled "On post, Darenth Wood, 12. 7. 73."

Neuria reticulata.—Series of 40, mostly from Dorset and Suffolk. The rest from various localities.

Pachetra leucophœa.—Series of 28 with data. All from Wye, Kent, except two labelled "Mickleham, Surrey, July 14, 1856."

Xylomyges conspicularis.—Series of 20, mostly var. *melaleuca*, Vieweg. Fifteen labelled "Taunton." Two from the Chitty Collection labelled "Wales 1888." One from the Meldola Collection labelled "Worcester."

Eumichtis satura.—This rarity is represented by one specimen from the Sellon Collection labelled "*H. satura*, Oxford, Harper's Collection." It is possibly the specimen referred to in 'Barrett,' vol. iv, p. 113.

Crymodes exilis.—Six specimens, five with data. Three from the Meldola Collection are labelled "Rannoch." One, in poor condition, from the Sellon Collection, is also labelled "Rannoch." Another presented by Mr. J. Peed, by whom it was taken, is labelled "Unst. July 23-31, 1914."

(To be continued.)

NOTES ON BRITISH ORTHOPTERA, 1920.

By W. J. LUCAS, B.A., F.E.S.

FORFICULODEA (earwigs).—It is satisfactory to note that *Labidura riparia*, Pallas is still with us. On the shore near Southbourne, Hants, after a search of considerable length on August 31st, I succeeded in finding two examples. They were a nymph of pale colour in a well-advanced stage, and a large male imago perhaps slightly darker in colour than usual. The former when uncovered on the sand did not move, and it being of so pale a tint I did not notice it at first. The latter when exposed was on its back, and so it continued to lie as if dead; but when put into a box it turned its callipers over its back and assumed the “threatening” attitude. Both were found under the usual conditions on a slope of soft sand near the foot of the cliff. The nymph seemed rather afraid of the male, so at home, wishing to observe them for a while, I thought it best to put them in separate receptacles. On August 31st a little cooked beef was given, which the nymph attacked at once; but the male assumed the “threatening” attitude, though he shortly afterwards attacked his piece also. He was very ready to take up this peculiar attitude; the nymph I noticed do so but once. On September 2nd the male ate ripe plum a little, but apparently did not care for it; the nymph I did not see touch it at all. Later in the day they both devoured boiled turbot—the nymph a little, the male a considerable amount. On September 4th I gave them a little raw meat, which the nymph attacked readily: I did not see the male eat any, but on September 7th they both ate this provender readily. On September 10th I gave them some kipper, thinking that, from their habitat, fish would be suitable food; perhaps, however, the preservative in it was not to their liking, for they did not seem to care for it.

With regard to *Forficula auricularia*, Linn. it would be of interest to make certain to what extent the male hibernates as well as the female. On October 10th (which, however, was not very late) I took a male in Juniper Valley, Boxhill, Surrey. On the North Downs between Newland's Corner and Guildford I caught on October 17th one or two females, a rather pale-tinted male, and somewhat to my surprise a nymph, which, however, was probably in its last stage. These were the last specimens I met with during the season. An example of the variety *forcipata*, Steph. was taken in the Royal Horticultural Society's Gardens at Wisley, Surrey, in 1920 (Fox-Wilson), and a pronounced example of the same variety on July 21st at Blakeney Point, Norfolk (Green).

From H. Donisthorpe I received for inspection an example of *Forficula auricularia* devoid of callipers. This earwig he took by sweeping near Wokingham, Berks, on September 2nd, 1920.

It was kept alive more than four months, being killed on January 9th, 1921. The pygidium is well developed, but on each side of it, where the callipers should appear, are simply two blunt points, which are not even visible in a direct dorsal view. This most odd-looking insect I take to be a male from the structure of the last segment.

BLATTODEA (cockroaches).—Several specimens of the indigenous cockroach, *Ectobius lapponicus*, Linn., were seen on June 9th at one spot on Hackhurst Downs, Surrey. After securing a dark specimen I found that the others had sought safety in hiding. On June 26th one was taken at Ramnor, in the New Forest, and on September 8th a female was secured near Holm Hill (Lucas). The species was taken at Camberley, Surrey, on June 18th, and on August 7th, 29th and 30th (Green). Two females of the variety *nigripes*, Steph. of *Ectobius panzeri*, Steph. were taken on the slope of Holm Hill in the New Forest on September 4th (Lucas). *Blatta orientalis*, Linn., *Periplaneta americana*, Linn., and *P. australasie*, Fabr. were found in 1920 at the Royal Horticultural Society's Gardens, Wisley, the set including at least one nymph of *P. americana* (Fox-Wilson). On July 29th I received from E. A. C. Stowell a *P. americana*, with rather uniformly tinted pronotum, which was brought to him at Alton, Hants, just before that date. It was found in a hot-house and apparently had been imported with orchids. On November 26th in the warm reptile house at the Zoological Gardens in the afternoon a cockroach (clearly *P. americana*) was seen trying to get at a piece of biscuit (presumably thrown into the tank for the crocodiles!) This was beside a tiny island of stone, while between it and the cockroach were four or five inches of very shallow water. The insect clearly was aware by some means that the biscuit was desirable provender and, after some evident reluctance, crossed (its legs only being in the water) to the coveted prize and fed upon it heartily. A leaf in the middle helped it to ford the narrow strait. The incident was interesting as revealing a considerable amount of resourcefulness in the cockroach.

GRYLLODEA (crickets).—On March 17th in a damp situation a fine example of *Gryllotalpa gryllotalpa*, Linn. was found in a cottage garden at Send, near Woking in Surrey; while on July 7th a further example, a female, was caught in a cottage garden in the same village. The length of the latter from the head to the tip of the abdomen was 4.5 cm. (Fox-Wilson). Near Rhinefield in the New Forest on May 27th I met with a number of nymphs of *Nemobius sylvestris*, Fabr., the largest being about half-grown. I saw no adults. Some time later, on July 2nd, I took a male in the Forest, but it was still a nymph. There are always plenty of imagines in the Forest in August, the late summer being apparently the normal time for adults.

In the warm tortoise-house at the Zoological Gardens crickets were chirping merrily in the afternoon of November 26th. I could see none, but an attendant said that numbers were in the house. Presumably they were *Gryllus domesticus*, Linn. In dwelling-houses this cricket seems undoubtedly to be getting less common; in fact it is necessary to revise our estimate of its frequency.

LOCUSTODEA (long-horned grasshoppers).—In August three male imagines and a female nymph of *Metrioptera brachyptera*, Linn. were taken on Studland Heath, Dorset (Stowell). Female imagines—one on September 7th and one on September 9th—were secured in the New Forest (Lucas), while on the latter date two female imagines were taken at Bearsted in Kent (Green). *Conocephalus dorsalis*, Latr. was found to be in great abundance at Studland Heath in August, and a male imago and two female nymphs were captured (Stowell); while the species was reported as fairly common at Wicken Fen on August 15th (Lyle); a female sent thence came through to me alive. *Leptophyes punctatissima*, Bosc., *Meconema thalassinum*, De Geer, and *Metrioptera brachyptera*, Linn. were taken in 1920 at the Royal Horticultural Society's Gardens at Wisley (Fox-Wilson).

ACRIDIODEA (short-horned grasshoppers).—In the New Forest on May 21st a mature female of *Tetrix bipunctatus*, Linn. was taken of a nearly uniform yellowish-grey colour, the two spots from which its name is derived being scarcely visible. It was taken mature at Horsley, Surrey, on June 12th (Lucas). The species was captured in the Royal Horticulture Society's Gardens at Wisley in 1920 (Fox-Wilson). *Gomphocerus rufus*, Linn. was found of a rosy tint in Juniper Valley, Boxhill, Surrey, on October 10th. *G. maculatus*, Thunb. was taken there on the same day; it was first met with mature, female, on June 21st in the New Forest (Lucas). On September 10th I went in search of *Mecostethus grossus*, Linn. to Silverstream Bog in the New Forest. I saw but few; they were small and perhaps all males, the two I captured certainly being of that sex. *Plusia gamma*, Linn. kept flying up and deceiving one at the moment, though the mistake was soon discovered, since *M. grossus* flies in a straight line while the moth does not. The next day no examples were seen at Duck-hole Bog. *Stenobothrus lineatus*, Panz. was met with on one occasion only—in Juniper Valley, Boxhill, on October 10th (Lucas). *Omocestus rufipes*, Zett., female, was noted on September 20th in the New Forest (Lucas). *O. viridulus*, Linn., female, was found mature in the New Forest on June 21st (Lucas). On August 8th, female, and on September 12th, male, the species was found at Rainow in Cheshire (Neave). *Stauroderus bicolor*, Charp. was taken on the White Horse Hill near Sutton Poyntz in Dorset on September 29th. Both sexes of quite a dark grey tint were found at Esher Common on October 7th; the species was found there again on

October 11th, while a female was taken at the same place on October 25th with ruddy top of head and dorsal surface of thorax, the latter being pale-edged, the dorsal surface of the closed elytra being rather pale also (Lucas). Of *Chorthippus elegans*, Charp. a female was taken at Studland Heath in August (Stowell). Its commoner congener, *Ch. parallelus*, Zett., of both sexes, was found mature in the New Forest on June 25th (Lucas). It occurred at Lochgilphead, Argyllshire, in August (Morton). It was reported, male, on September 12th at Rainow (Neave). Both sexes were obtained in the New Forest on September 20th. In Juniper Valley, Boxhill, it was taken of a rosy tint on October 10th (Lucas). It was found to occur in the Royal Horticultural Society's Gardens at Wisley in 1920 (Fox-Wilson).

Kingston-on-Thames;
February, 1921.

NOTES AND OBSERVATIONS.

MELITÆA ATHALIA, ROTT., AND M. PSEUDATHALIA, REVERDIN.—Dr. Reverdin has carried his investigations of the male appendages of *M. athalia* to a definite conclusion that the species hitherto passing under this name must be divided. *Athalia* is, in fact, a "portmanteau" species, as was found also by him to be the case with *Hesperia malvæ*, and has long been suspected, but I believe not yet established, with *M. phæbe*. In other words, a hitherto unknown species, which he now names *pseudathalia*, exists quite commonly over certain areas west of the great central alpine *massif*, and as at present determined south of the Juras, and (?) the valley of the Loire. A full account of the discovery with woodcuts of the respective male appendages is published in the 'Bulletin de la Société entomologique de France,' 1920, No. 19, and was communicated to the Society at their meeting on December 8th last. Dr. Reverdin states that his inquiry was stimulated by Mr. Sheldon's publication of the male *athalia* armature published in the 'Entomologist's Record,' 1916, p. 261, pl. iii, and our congratulations, therefore, are due also to Mr. Sheldon, with whom Dr. Reverdin has been in correspondence since he took the matter in hand. Fortunately the discovery entails no change of the nomenclature of our English *athalia*, which is identical with von Rottemburg's species, nor does the new species extend to our islands. At present Dr. Reverdin does not claim to have discovered characters whereby to distinguish the two species superficially, and it now remains to initiate a series of breeding experiments to ascertain what differences are apparent in the earlier stages. *Athalia* has ever been something of a puzzle to those of us whose observations have been made on the Continent. It is only by the collation and comparison of long series that it is possible, in my opinion, to arrive at a fair conclusion otherwise than by dissection of the appendages. But, just as a long series of *H. malvæ* and *H. malvoides* in the cabinet presents to the eye an obvious but difficult-to-define distinctiveness

in *fresh* examples, so I hope it may be possible, once the range of distribution of *athalia* and *pseudathalia* is ascertained, to separate them also one from the other. Dr. Reverdin states that he has no record of the two species occurring together; further, that the black markings of *athalia* appear to be much more accentuated and dominant than in *pseudathalia*. Collectors abroad this year, or those who have accumulated duplicates on the Continent to any extent, will greatly assist Dr. Reverdin by providing him with additional material for his researches. Examples already examined from localities east of the central European Alps to the Amur and Japan are so far identified with the true and original *athalia*.—H. ROWLAND-BROWN; Harrow Weald, February 5th, 1921.

DISAPPEARANCE OF AGRIADES CORYDON AB. SYNGRAPHA FROM THE CHILTERN. — May I express my appreciation of Mr. Rowland-Brown's remarks under the above heading in your February issue. It is unfortunately true that the gentleman with the "coal sack" has been too much in evidence during the past few years. It is almost unnecessary to refer to the extinction of *Chrysophanus dispar* and the sadly diminished numbers of *Papilio machaon*, but it would appear that unless something can be done many other species are likely to disappear from their favourite localities. A few instances from my own little experience may not be out of place in this connection. Some years ago I, in company with two other enthusiasts, made an attempt to establish *P. machaon* in a certain locality in the Essex marshes. A number of pupæ were "planted" in a spot where food-plant was abundant, and the whole surroundings approximating to *machaon's* habitat in Fenland. That many imagines did emerge is certain, for in one week a farm-hand brought two males to me which he had knocked down with his hat. The following week several more were taken in the district. The matter was noised abroad, and despite our appeals that *machaon* might be respected for at least one season, in a short time the neighbourhood was over-run by every "collector" within reach. The project was, possibly, a little ambitious, but I feel convinced that, given a sporting chance, *machaon* might have established a colony in a new locality. Again, when on leave from France in the summer of 1916 I was fortunate enough to discover *Thecla w-album* in considerable numbers in a hitherto unsuspected locality in Kent. In this case history repeated itself. Last summer, when roaming around in the county last referred to, I was much surprised to see a fine specimen of *Aporia crategi*, which I duly netted. Two more were seen within half-a-mile of the spot. From general observation in this district I am sanguine that *crategi* is making a determined effort to extend inland, and in this case I am emulating Brer Rabbit.—F. HOWARD LANCUNY; "Fernside," Shepherds' Lane, Dartford.

A NEW NON-CORROSIVE PIN. — There is no need to emphasise the advantages of a pin which will not corrode or "verdigris" in use or when in contact with cork carpet, sour paste and the various substances now used to preserve our collections. The necessity for such a pin is felt more by micro-lepidopterists than by collectors of other orders, because of the small size of the pins they use and the short

time it takes to complete the destruction of a specimen once verdigris sets in. Pins made of silver wire—or rather, alloy, mainly silver—have hitherto given complete satisfaction, but the supply has ceased and our stocks have given out. Under these circumstances lepidopterists will be pleased to hear of a cheap and efficient substitute for silver. A year ago I found a wire which possesses all the advantages of silver as regards corrosion; it is of a dark grey colour, much cheaper than silver, and in addition it is of sufficient stiffness for the purpose intended. My experiments show the wire to be perfectly free from attack by the fatty acids in moth grease, and further, there is no action by organic acids in general. Most lepidopterists are aware that verdigris is formed on the pins in our cabinets by the action of the fatty acids, mentioned above, upon the copper in the brass pins generally used. I have supplied several of my friends with the new wire at various times during the last season; they have pointed it themselves and report favourably as regards its use. My own stock of silver pins is now exhausted, and I am having some made from the new wire for use during this coming season. The great difficulty is to find somebody to point the wire; dealers tell us that their efforts in this direction meet with no success. Lepidopterists, like other people, dislike change, but if those who study only the Macros would demand an improved pin it would soon be to the advantage of a manufacturer to produce it, because the quantity required would make it worth while. As there seems to be very little chance of getting pins made for us in time for the coming season, I am obtaining a sufficiency of the wire of diameter suitable for Noctuæ, Geometridæ and the various Micros, and shall be ready to supply those who wish to try it. The price cannot be stated at present, as it is not my intention to make a profit; it will depend upon the thickness of the wire, which will be wound on bobbins of one ounce for the larger sizes and on half-ounce bobbins for Micro sizes. In conclusion, I shall be delighted to hear from anyone who will seriously consider making these pins for the market.—WM. MANSBRIDGE; "Dunraven," Church Road, Wavertree, Liverpool.

[I have tried Mr. Mansbridge's non-corrosive wire and find that it resists all tendency to verdigris, so far as I have been able to apply the tests, and think it is a very good substitute for silver pins. The great difficulty, as Mr. Mansbridge says, is getting the pointing done. Last year I pointed several hundreds of pins with the aid of a small file, but this is a very laborious process. I am told that by using an emery or carborundum wheel this labour can be much reduced; personally I have not yet acquired the knack of doing this, but one of my friends informs me he does not find any difficulty. He has certainly put most excellent points on about 200 pins for me.—W. E. SHELTON.]

BUTTERFLY NOTES FROM CUMBERLAND.—I found 1920 a poor year for insects in general, some of the orders—Hemiptera, for instance—being extremely scarce. Butterflies, as was to be expected in such a wet summer, were, with few exceptions, uncommon. Most of my observations were made near Carlisle, on the borders of the Solway Firth, or on the south-west coast near Drigg, where I spent a fortnight

in July. *Pieris brassicæ*, *P. rapæ* and *P. napi* were scarcer than usual, especially *brassicæ* in the second brood. *Euchloë cardamines*, as a rule a common species in our lanes and marshy fields, was not so in 1920, but I got two nice, undersized males. I saw very few ova. *Aglais urticæ* was fairly common after hibernation in the spring, but I saw few broods of larvæ as the season went on, except near Seascale, where, in one lane, the nettles were reduced to bare stalks by a large congregation, obviously the product of several females. *V. io*, nowadays a rarity here, I did not meet with, but heard of two examples in different parts of the county. I saw one *Pyrameis cardui* in May down the Solway, but did not again meet with the species. On the other hand *P. atalanta* was fairly common and continued late into October, when the weather was really better than in the summer. *Argynnis aglaia* was abundant near Drigg on the rough ground behind the sandhills. I was pleased to find a new locality for *Brenthis euphrosyne* at the end of May. This is a scarcer and more local butterfly in Cumberland than *B. selene*. The latter, however, was not so abundant as usual. *Hipparchia semele* was on the wing while I was at Drigg, favouring lanes and hedgerows as well as the sandhills. It also was far from being as common as usual. *Pararge megæra* occurred commonly in the spring brood, the August emergence being much less pronounced. *Epinephle jurtina*, of course, was common, and seemed little affected by the adverse season. *E. tithonus*, a very local butterfly in Cumberland, and largely confined to the southwest of the county, I was too early for when at Drigg in July, and only one specimen was seen. *Aphantopus hyperanthus* was decidedly scarcer than in other years, and I saw few varieties of note. *Cæonympha tiphon* was in bad condition when I noticed it in June on one of its favoured mosses. *C. pamphilus* was another usually common species which seemed to find the season an unfavourable one. *Callophrys rubi* was fairly frequent on Cumwhitton Moss. *Chrysophanus phlæas* was scarce but *Polyommatus icarus* common, and I got one fine example of var. *cærulæa* of the female. *Nisoniades tages* was, if anything, commoner than usual, but local, while our only other Cumberland skipper, *Argiades sylvanus*, was seldom seen.—F. H. DAY; 26, Currock Terrace, Carlisle.

COLIAS EDUSA, ETC., IN HAMPSHIRE.—While staying at Milton, Hants (about six miles east of Christchurch), last August I took fifteen specimens of *Colias edusa*, and I have heard that others took it there also about the same time. Most of those I took were very worn, some badly chipped, but six, four ♂ and two ♀, were quite fresh. I kept one worn ♀ alive in a muslin cage over a potted clover plant. She lived for about a fortnight, and then died without having laid any eggs. The ground above the cliffs, for several miles each side of Milton, is covered with rough grass, clover and trefoil, the flowers of this last seeming especially attractive. The butterflies appeared to travel along the coast from east to west. From August 6th to the 12th I saw only two specimens of *Colias edusa*. On the 13th I took one and saw two others, and I met another entomologist who had taken several that morning about a mile east of Milton. On the 14th I took six and saw many others at Milton.

On the 15th I took eight and also saw others about a mile west of Milton, whereas I saw none nearer Milton, although I was on the look-out for them. Has any other reader noticed this kind of coastal migration in this or any other species? I also found *Pyrameis cardui*, *P. atalanta*, *Hipparchia semele* and many other species very abundant in this part of Hampshire.—W. H. PALMER; 192, Selsdon Road, South Croydon, Surrey, February 19th, 1921.

CHRY SOPHANUS PHLEAS, VAR. CÆRULEO-PUNCTATA, ON DRY GROUND.—Towards the end of May, 1919, I came across a colony of *C. phleas* in a grassy clearing on Croham Hurst, a wooded hill near Croydon. Although only a few of these were really well-marked var. *cæruleo-punctata*, almost all had a greater or lesser amount of blue on the underwings. It may be remembered that May, 1919, was an exceptionally hot and dry month; also Croham Hurst is composed chiefly of gravel and chalk and rises well above the surrounding land. I therefore found this blue-spotted form in an exceedingly dry spot, whereas Mr. J. C. Melvill ('Entom.,' vol. liv, p. 17) and others found theirs in damp places.—W. H. PALMER; 192, Selsdon Road, South Croydon, Surrey, February 19th, 1921.

POLYGONIA C-ALBUM IN GLOUCESTERSHIRE IN 1920.—I have just come across Miss Coney's account ('Entom.,' vol. liv, p. 78) regarding *Polygonia c-album*, and perhaps the following may be of interest to your readers: During the early part of last September I was at Withey Beds Camp, near Stroud, Gloucester, and one warm, sunny afternoon, as I was reading, with my net alongside in case anything turned up, I saw something below me which seemed uncommon. On catching the insect I discovered it to be *Polygonia c-album* in perfect condition. I may add that this was my first capture of this butterfly.—J. H. VICKERS; 16, Talgarth Mansions, Barons Court, London, W.

SESIA CULICIFORMIS FORCED.—Last September I collected three larvæ of *S. culiciformis*, and placed them in a tin box which contained a living larva of *C. cossus*. The latter larva ate two of the former; the remaining one formed a cocoon of sawdust. It was then put in a forcing cage (temperature about 55°) and a fine ♂ emerged on February 27th.—G. H. HENSHALL, Eltham, S.E.

PHIGALIA PEDARIA MONACHARIA.—On February 14th I took a good specimen of *Phigalia pedaria* ab. *monacharia* on a lamp-post, and saw another the following night on a wall. Winter moths are quite common this year.—WALTER PIERCE; Queen's Road, High Wycombe.

TORTRICES FROM RANNOCH, BRED.—Certain pupæ resulting from larvæ obtained in the Rannoch district in 1919, and which did not emerge in that year, produced moths in the spring of 1920. They included two female examples of *Philedone prodromana*, one of *Lophoderus politana*, and several of *Peridrina dimidiata*; they all came from larvæ feeding upon *Myrica gale*. I was much surprised at the emergence of *L. politana*; the larva which produced it did not at all agree with that described of this species. I had an hour to wait at Rannoch Station on my return home in August, and to pass away the time I strolled across a piece of bog near by on which there

was growing a luxuriant crop of *M. gale*. A *Tortrix* larva was common on this, which agreed, so far as I could see, with those of *Peronea maccana*, which I had been taking a few weeks before at Camghouran, and I put it down to be that species, but to make sure took away one larva, from which, to my surprise, emerged a specimen of *L. politana*.—W. E. SHELDON.

PERONEA CRISTANA, ERRATA.—In my paper on this species, on p. 16 of the present volume of this magazine, I say that ab. *sequana*, Curtis, requires eliminating from the list in favour of ab. *combustana*, Duponchel. This is an error. My friend, Mr. J. H. Durrant, points out to me that Duponchel did not give the name *combustana*, but adopted it from Hübner, who used it for a form of *hastiana*, Duponchel wrongly applying it to a form of another species, *cristana*. Curtis's name of *sequana* should therefore stand, and ab. *combustana*, Duponchel, must fall as a synonym of it. On p. 38 I find that ab. *lichenana*, Curtis, is omitted; it, of course, should appear. I make its position to be after ab. *sub-chantana*, Clark, in Group 2.—W. E. SHELDON.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—December 9th.—The President in the Chair.—Mr. J. J. Joicey, F.E.S., The Hill, Witley; Mr. G. Talbot, F.E.S., The Hill Museum, Witley; Mr. A. J. Wightman, 35, Talbot Terrace, Lewis; and Mr. L. Ford, Park Hill, Bexley, were elected members.—Mr. Sperring exhibited a Cassid, *Aspidomorpha*, sp., from Central Uganda.—Mr. Main made a series of remarks on the keeping of ants in artificial formicaria.—Mr. A. A. W. Buckstone, further series of dwarf *Agriades coridon* from Surrey, and a second brood of *Euphyia picata*.—Mr. Bowman, aberrations of *Polyommatus icarus* from Folkestone.—Mr. B. S. Williams, *Bithys quercus* ab. *major* from Cornwall and an asymmetrical *Cænonympha pamphilus*.—Mr. Goodman, a pupa of *Hyles euphorbiæ* from a Courmayeur larva.—Mr. K. G. Blair, ab. *parvipuncta* of *Rumicia phlæas*.—Mr. R. Adkin, a series of *Ptychopoda dimidiata* (*scutulata*) with their cocoons, and read notes on the pupation, showing the natural position to be among rubbish on or near the surface of the ground.—Mr. Hy. J. Turner, a small collection of butterflies from W. Java.—Mr. Adkin, the Society's delegate to the Conference of the British Association, read a short report of the meeting.

January 13th, 1921.—Mr. K. G. Blair, B.Sc., President, in the Chair.—Lord Rothschild, of Tring, and Mr. F. W. Enefer, of 2, Blackheath Vale, were elected members.—Mr. R. Adkin exhibited a *Margarodes unionalis* taken near Abbot's Wood, Sussex, and gave notes on the occurrence of this interesting migrant.—Mr. Blenkarn, local species of Coleoptera, including *Henoticus germanicus*, Craven House, Strand, *Necrophorus interruptus*, Box Hill, *Cassida hemispherica*, Chiswick, four species of *Hydroporus* from Coatbridge, etc.—Mr. Hy. J. Turner, a box of butterflies sent to Mr. Sperring by our member Mr. G. B. Pearson from California, including fine series of the spring gen. *galactinus* of *Cænonympha californica*, of the dark

Melitæa, *M. chalcon*, a *Papilio rutilus*, *Anthocharis sara* forms, *Colias eriphyle*, summer form *eurytheme*, *Brephidium exilis*, one of the smallest butterflies of the world, (*Lycæna*) *avalon*, only found in S. Caterhina Island, S. California, several *Hesperiidæ*, etc., and read a communication on the exhibit from Mr. Pearson.—Mr. T. H. L. Grosvenor, *Papilio glycerion*, and its races and allied forms from Sikkim and Thibet.—Mr. B. S. Williams, *Lycæna arion* from Cornwall.—Messrs. H. Main and A. E. Tonge, photographs of items in life-histories of common insects and ova of Lepidoptera respectively.

January 27th.—The President in the chair.—Annual Meeting.—There was a large attendance. After the formal business was completed, the President, Mr. K. G. Blair, read his address "Insects in Winter," and votes of thanks were passed. Ordinary Meeting.—Mr. Step exhibited a large locust found alive at large in Covent Garden with a small crowd of timorous watchers around.—Mr. Coppeard, a series of colour forms of the water-plant beetle *Donacia sericea*.—Mr. Turner, a box of Rhopalocera sent from near Port Elizabeth, South Africa, including the cosmopolitan *Lampides batiscus*, a fine series of the Satyrid *Leptoneura chytus* and species of *Pieris*, *Terias*, *Teracolus*, *Mycæles* and *Pamphila*.—Mr. Lucas, the Neuropteran, *Hemerobius stigma*, now common on Esher Common.—Mr. Leeds, 177 different forms of male *Polyommatus icarus* named from the descriptions given in J. W. Tutt's 'British Lepidoptera.'—HY. J. TURNER, *Hon. Editor of Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, November 15th, 1920, the President, Mr. S. P. Doudney, in the Chair.—Mr. G. H. E. Hopkins, Shevington Vicarage, near Wigan, and Mr. A. R. Davidson, Foster Road, Formby, were elected members of the Society.—A paper was read by Mr. S. Gordon Smith, F.E.S., entitled, "A Year's Collecting of Macro-Lepidoptera." In this most interesting paper Mr. Smith related his experiences in pursuit of Lepidoptera from the autumn of 1919 until October of the present year. Delamere Forest came in for a good deal of attention, and by persistent hard work Mr. Smith has obtained some lovely sets of variable insects; he showed that *Nyssia hispidaria*, previously considered rare in the forest, was quite a common insect, and had further established, by counting a large number of moths on the trees, that *Phigalia pedaria*, var. *monarcharia*, occurred in the proportion of about one to three of the type in this locality. A large part of the paper was taken up with the results of breeding; large numbers of the larvæ of the *Vanessidæ*, in particular, passed through the cages and yielded some fine varieties. Probably the most interesting section of the paper was that dealing with the visitors to electric light. The author had installed a 2000 candle-power lamp on the balcony of his house overlooking the river Dee and the flat, open country beyond. Records of temperature and weather were kept and their bearing on the number of insect visitors noted. *Thamnoma brunneata*, *Acronycta alni* and its black variation, *Cirrhædia xerampelina* and *Dicranura furcula* were among the species that came

to light. A discussion ensued, in which Prof. Newstead, the Rev. F. M. B. Carr and Mr. Wm. Mansbridge took part. A vote of thanks was carried by acclamation.—Mr. Carr exhibited a variable series of *Peridromia saucia*, also *Xanthia ferruginea*, *Calocampa exoleta* and *C. vetusta*, all taken in his garden at Alvanley on sugar and rotten fruit; from Prince's Risboro' a series of *Thera juniperata*.

ANNUAL MEETING, December 20th.—The President in the Chair.—The following were elected as officers and council for the ensuing year, viz.:—President: R. Tait, F.E.S. Vice-Presidents: J. W. Griffin, F.E.S., S. Gordon Smith, F.E.S., S. P. Doudney, H. M. Hallett, F.E.S. Hon. Treasurer: J. Cotton, M.R.C.S., etc. Hon. Librarian and Assistant Secretary: C. P. Rimmer. Hon. Secretary: Wm. Mansbridge, F.E.S. Council: A. W. Hughes, R. Wilding, W. Webster, F.R.S.A.I., Hugh Main, B.Sc., F.E.S., L. West, M.I.M.E., A. W. Boyd, M.C., F.E.S., A. R. Jackson, M.D., D.Sc., W. J. Lucas, B.A., F.E.S., B. H. Crabtree, F.E.S., A. Newstead, F.E.S., Rev. F. M. B. Carr, E. F. Studd, M.A., F.E.S.—The President read an address entitled, "The Lepidoptera of Wicken Fen"; he also exhibited series of insects in illustration.—Other exhibits of Fen insects were made by Messrs. Wm. Mansbridge, C. P. Rimmer and S. Gordon Smith.—Mr. J. B. Garner-Richards, The Liverpool Collegiate School, Shaw Street, Liverpool, was elected a member of the Society.—WM. MANSBRIDGE, *Hon. Sec.*

SOUTH WEST YORKSHIRE ENTOMOLOGICAL SOCIETY.—At the invitation of Mr. B. Morley, the members of this Society held their annual meeting at his house at Wind Mill, Skelmanthorpe, on January 16th last. There was a good muster of members, and a large number of lepidopterous duplicates were exchanged. At the conclusion of the Society's business the following exhibits were passed around: By Mr. E. G. Bayford: Orthoptera—*Periplaneta australasiae*, F., from Barnsley; Coleoptera—*Anthrenus musaorum*, L., from Leeds.—By Mr. T. H. Fisher: Coleoptera—*Leistus fulvibarbis*, Dej., *Ocys harpulinoides*, Serv., *Ontholestes murinus*, L., *Staphylinus pubescens*, De G., *Corymbites pectinicornis*, L., *C. cupreus*, F., and var. *æruuginosus*, F., *Xylotenus domesticus*, L., and *Blaps mucronatas*, Latr., from the Skelmanthorpe district. Mr. Fisher also showed the following Lepidoptera: A series each of *Bombyx* var. *calluna*, from Penistone Moors, *Pieris napi* and *Scopelosoma satellitia* from Skelmanthorpe district.—By Mr. G. T. Porritt: Specimens of the newly separated *Pædisca sinuana*. *Sciaphila penziana* from Grassington, taken by Mr. W. G. Clutton in 1911, the first Yorkshire specimen. An almost clear white specimen of *Spilosoma menthastris*, specimens of the rayed form *walkerii* and the brown form from North Scotland. Scottish and English specimens of *Melanippe hastata* along with a fine suffused variety from near Huddersfield.—By Dr. H. D. Smart: A long series of English and Irish *Pieris napi* of both spring and summer broods showing a wide range of variation.—By Mr. J. Hooper: *Argynnis* var. *valesina*, also confluent *Zygæna trifolii* from the New Forest, and *Melanargia galatea* from the Isle of Wight.—By Mr. E. Cocker: A brown suffused variety of *Arctia caia* from Huddersfield district.—The evening was spent looking at the Morley Collection of Lepidoptera.—B. MORLEY, *Rep. Sec.*

EXCHANGE

例題 10. N の子群 H について、 H の陪集 aH と bH が一致しないならば、 $aH \cap bH = \emptyset$ であることを示せ。

[illegible]

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDESBURY, NW 2.

MEETINGS OF SOCIETIES.

[illegible]

CONTENTS.

Fossil Tipulidæ from the Oligocene of the Isle of Wight, *T. D. A. Cockerell and F. H. Hayes*, 81. Effect of the Early Spring of 1920 on British Lepidoptera, *A. W. Mearns*, 84. New Forest Notes and Captures, 1920, *Hugh P. Jones* (continued from p. 71), 88. Lepidoptera in Perthshire, 1920, *F. G. Whitte*, 89. Notes on the life history of *Chrysobothris* and *Phryganea* in the New Forest, 1920, *H. P. Jones*, 90. The life history of the caddisfly *Trichoptera* in the New Forest, 1920, *H. P. Jones*, 91. The life history of the caddisfly *Trichoptera* in the New Forest, 1920, *H. P. Jones*, 92. The life history of the caddisfly *Trichoptera* in the New Forest, 1920, *H. P. Jones*, 93. The life history of the caddisfly *Trichoptera* in the New Forest, 1920, *H. P. Jones*, 94.

[illegible][illegible]

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

CABINETS. Finest Materials. Best Workmanship.
Any size made to order.
Drawing on application.

PUPÆ.

THE UNIVERSITY OF CHICAGO PRESS

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.

Vol. LIV.]

MAY, 1921.

No. 696.

THE
Journal
ENTOMOLOGIST,

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.	W. J. LUCAS, B.A., F.E.S.
H. ROWLAND BROWN, M.A., F.E.S.	CLAUDE MORLEY, F.E.S., F.Z.S.
W. L. DISTANT, F.E.S. &c.	DR. D. SHARP, F.R.S., F.E.S., &c.
F. W. FROHAWK, F.E.S., M.B.O.U.	D. RILEY, F.E.S.
C. J. GAHAN, D.Sc., M.A., F.E.S.	W. G. SHILDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST-NEWMAN, LTD.,
BARTHOLOMEW CLOSE, E.C. 4.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also

Birds' Eggs

(Singles as well as in Clutches).

Our CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

WANTED. All kinds of European (other than British) Lepidopterous Ova, Larvæ or Pupæ in small quantities and known to feed on vegetation indigenous to Britain. French language understood. Offers to

HENRY W. DOBSON, 14 & 16, Finkle Street, KENDAL.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections. 200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

BRILLIANT BUTTERFLIES.

WANTED TO PURCHASE. Morpho, Urania, Lycaena and Mixed lots of Tropical Butterflies. Collectors wanted in all parts of the Tropical world. Correspondence solicited. Morphos for Sale.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

THE ENTOMOLOGIST.

VOL. LIV.]

MAY, 1921.

[No. 696

NEW FORMS OF SPHINGIDÆ.

By J. J. JOICEY, F.E.S., F.L.S., ETC., AND G. TALBOT, F.E.S.

THE types of the forms herein described are in the Hill Museum. We are obliged to Dr. K. Jordan for his valued opinion on forms 1-5. Figures of these forms will be published when opportunity permits.

1. *Oxyambulyx ceramensis*, sp. nov.

Allied to *wildei*, Misk., from Australia and New Guinea, but distinguished by the larger rounded sub-basal spot on the fore-wing and the more strongly marked underside. May only be a race.

♂ ♀. Upper side with the coloration of *wildei* but somewhat darker. Fore wing with a very large sub-basal spot. The sub-marginal line below vein 3 farther from the margin than in *wildei*. The sub-apical line from costa to sub-marginal line strongly marked. Hind wing with discal line more heavily marked than in *wildei*, the anal patch darker, and marginal line more strongly developed and much darker. Underside with darker markings than in *wildei*, and sub-marginal line of fore wing farther from the margin. Hind wing with markings as above. Head, thorax and abdomen with the same coloration and markings as in *wildei*.

Length of fore wing: ♂ 51 mm., ♀ 57 mm.

Hab.—Mount Manusela, Central Ceram, 6000 ft., October-December, 1919, C., F. & J. Pratt, 1 ♂, 1 ♀.

2. *Clanis pratti*, sp. nov.

Named after Mr. James Pratt, the youngest of the three brothers who collected in Ceram, and whose first collecting trip it was.

Allied to *bilineata*, Walk. Distinguished by the distinct *triangular* costal patch of the fore wing and the absence of any chocolate-brown coloration on the hind wing. Fore wing broader, outer margin not incurved.

♂. Upperside of fore wing darker ochreous than in *bilineata*. Triangular costal patch grey-white suffused with pinkish, sharply defined, outer edge longer than it is in *bilineata* and crossing vein 7 beyond its point of origin. Outer crenulate post-discal line farther from the margin than in *bilineata*, the inner line not defined above vein 6. Hind wing dusky ochreous, blackish basally, and paler at the

margins. A slight lilac suffusion at the anal angle. Underside slightly darker than in *bilineata*. Fore wing with shorter black stripe below the cell, apical patch grey white, faintly pinkish. Hind wing with the outer two post-discal lines less distinct and becoming obsolete posteriorly.

Length of fore wing: 64 mm.

Hab.—North Manusela, Central Ceram, 2500 ft., March, 1919, C., F. & J. Pratt, 1 ♂.

This specimen was bred from a larva brought in by natives. "For about two weeks it barely moved, making no attempt to eat or search for food. On December 30th we put it in a box with earth. It immediately burrowed, and did not cast its skin until early in February. The imago emerged on March 5th."

The larva is briefly described by Messrs. Pratt as follows: "The larva is green with five lateral ridges the whole length of the body. It is covered with tiny protuberances, forming a rasping surface."

Pupa.—The pupa-case was sent and may be described as follows: It is 60 mm. in length and 17 mm. in diameter at the wing-cases. Proboscis sheath reaching about to the tip of the wing-cases. The eighth and ninth segments show a slight and broad protuberance on the ventral side. The cremaster is broadly triangular, 3 mm. at the base and 2 mm. long.

3. *Clanis hawkeri*, sp. n.

Quite distinct from any other in the genus. Fore wing with apex not pointed, outer margin slightly rounded. The palpi are smaller and shorter than in other species, and the second segment is more concave. The hind wing has the discocellulars more oblique. We hesitate to make a new genus for this species, though it may possibly be distinct, but further material of this or other species with similar characteristics is desirable.

♂. Upper side of fore wing vandyke brown, with oblique transverse bands of darker brown with grey-white discal and basal suffusion. A sub-basal line, a second line crossing the wing at vein 2, both edged with grey white on the inside; a discal line crossing the wing at origin of vein 3, broader in cellule 2 and not reaching the submedian; a post-discal line, strongly marked from the origin of vein 6 to vein 4, where it curves inward and is indistinct to the submedian; a second post-discal line, less distinct, from base of cellule 6 to vein 4, and bordered with a grey-white suffusion on each side; a heavily marked sub-apical band, anteriorly broad at vein 7, and reaching vein 5. These lines or narrow bands are not well defined and are diffuse on their edges. An indication of greyish longitudinal stripes in cellules 2-4. Hind wing dull red brown, with a marginal border of grey brown, darker anteriorly. Inner margin creamy white. Underside of fore-wing pale ochreous brown, the basal half red brown like the hind wing above. Distal margin grey white with a pink tinge, this colour produced as narrow stripes in cellules 2-5. The outer three bands of

the upper surface are faintly marked. The apex is reddish brown. Hindwing pink irrorated with grey white more especially in the basal half and on inner margin. A thick, slightly curved discal line of darker red between veins 8 and 3; a more faintly marked dentate sub-marginal line from costa to anal angle, slightly angled at vein 5. Antennæ dirty grey. Head blackish brown, greyish at the sides. Palpi with outer part of second and third segments blackish brown, inner half of these segments and segment 1 chocolate brown. Collar blackish brown. Patagia vandyke brown irrorated with grey white. Abdomen grey brown above, below paler tinged with pink. Segments above darker at the base and narrowly ringed with golden orange. Pectus grey white, tinged with pink. Fore- and mid-femora grey white tinged with pink, tibiæ and tarsi blackish brown. Posterior femora and tibiæ grey white tinged with pink.

Length of fore wing: 26 mm.

Hab.—French Indo-China, 1 ♂.

4. *Pachygonia ribbei peruviana*, sub-sp. nov.

Pachygonia ribbei, Druce, Biol. Cent. Amer., Het., 1, p. 4, pl. i, f. 2 (1881) (Chiriqui).

♂. Differs from typical *ribbei*, Druce, in the darker brown coloration of the upper surface, especially of the hind wing, where, however, the lines are more distinct. The underside is more ochraceous than in the typical form and the post-discal line of the fore wing is narrower.

Hab.—Rentema Falls, Upper Marañon, N. Peru, 1000 ft., A. E. Pratt.

5. *Nephele leighi*, sp. nov.

Distinct from any other known form in the genus, but resembling *æquivalens*, Walk., in the absence of black patches on the abdomen. The hind tarsi are, however, shorter than in this species.

Upperside with ochreous-brown ground-colour. Fore wing in basal lower part dark greenish ochreous. An oblique darker brown discal band, not very distinct; a similar post-discal band, anteriorly broader and ill-defined, slightly angled at vein 3; an irregular faint post-discal line. A very irregular sub-marginal line marking off a darker distal area which is evident in cellules 4 and 5; a second sub-marginal line divides the narrow ochreous-brown marginal from the inner blackish-brown area, which is slightly dusted with grey. Hind wing dark greenish ochreous; distal margin deep brown, narrowing posteriorly. Underside paler ochreous brown. Fore wing with the dark marginal area well marked. Hind wing with three not strongly marked discal lines, the middle one about midway between the others, and only distinct to the submedian. Head, palpi and pectus grey as in *æquivalens*. Antennæ grey white above, brown below. Thorax dark greenish ochreous. Abdomen pale ochreous without markings. Legs pale ochreous.

Length of fore wing: 41 mm.

Hab.—Mahe, Seychelles; G. F. Leigh, 1913, 1 ♀.

We have taken the liberty of naming this after Mr. Leigh, who collected in the Seychelles in 1913 on behalf of Mr. Joicey.

6. *Theretra clotho manuselensis*, subsp. nov.

Distinguished from the typical form by the post-discal line of the fore wing being incurved to the costa near the apex.

♂ ♀. Post-discal line of fore wing incurved near apex, forming a sharp angle with a short oblique line from the costa. This is more strongly marked in female specimens. The underside ground colour is more reddish than in the typical forms. Abdomen with black basal patch reduced in the majority of specimens.

Described from a long series from Mount Manusela, Central Ceram, 6000 ft., October–December, 1919, C., F. and J. Pratt.

7. *Theretra clotho papuensis*, subsp. nov.

This form may have something to do with *incarnata*, R. & J., regarded from the point of view of colour, but as we are unable to find any factor pointing to specific distinction from *clotho*, we prefer to treat the form as a race of that species. A study of the genital armature of *clotho* and the allied forms is necessary to clear up the obscurity surrounding these at present.

The form *celata*, Butl., was regarded by Rothschild and Jordan as a race of *clotho*. It is of interest to record the existence of this form on Ceram and in Dutch New Guinea in company with *clotho*. This suggests that *celata* is a distinct species.

♂ ♀. More nearly allied to the Ceram form than to the typical one. The black abdominal basal patch is obsolete or absent. Fore wing either dull greenish grey or pinkish testaceous, in the former case with much paler more greyish sub-basal and distal area. The dark oblique line is mostly separated from the apical line and is joined to a short costal line as in the Ceram form. Pale discal lines obsolete or absent. Hind wing anal patch more pinkish than in typical form. Underside pinkish grey thickly speckled with black. Fore wing with black basal area washed with grey, distal marginal area only slightly paler than the ground-colour. Hind wing with discal lines not clearly defined. Legs and underside of body more pinkish than in the other forms.

Hab.—Wandammen Mountains, Dutch New Guinea, 3000–4000 ft., November, 1914, A., C. & F. Pratt, 6 ♂ ♂, 4 ♀ ♀; 6000 ft., 1 ♀.

8. *Cechenea helops interposita*, subsp. nov.

This form presents the characteristics of the typical form on the upper side, but is more like *papuana*, R. & J., below.

♂ ♀. Upperside coloration and markings as in the typical form. Fore wing with fringes as in typical form, black basal patch

more extended along the margin. Hind wing with anal patch sharply defined on the outer edge, between which and the margin there is no pale scaling. Underside with the pinkish-ochraceous coloration of *papuana*. Fore wing with costal spot joined to a large apical patch continued to vein 6 as a heavy curved spot, which encloses a small marginal spot of ground-colour. Hind wing with distal dark marginal band broader than in the typical form but less so than in *papuana*. Discal band broader than in typical form. The anterior femora with blackish-grey hair as in *papuana*. The second and third dorso-basal abdominal grey patches smaller than in the other two forms. No sharply defined pale lateral patch on segments 4 and 5.

Hab.—Mount Mansuela, Central Ceram, 6000 ft., October–December, 1919, C., F. & J. Pratt, 5 ♂♂, 7 ♀♀.

NOTE ON CHANGE IN SYNONYMY.

Cechenea sumatrensis, Joicey & Kaye, Ann. and Mag. Nat. Hist. (8), xx, p. 307 (Sumatra), 1917.

This species has been examined by Dr. K. Jordan, who pronounces it to be a specimen of *Theretra boisduvali*, Bugn.!

Timoria concolorata, Kaye, Ann. and Mag. Nat. Hist. (9), iv, pp. 93–94 (Tenimber), 1919.

The genus *Timoria* was described as new, but both must sink to *Heise luctifera*, Walk.

We are obliged to Dr. K. Jordan for this correction.

FOSSIL TIPULIDÆ FROM THE OLIGOCENE OF THE ISLE OF WIGHT.

By T. D. A. COCKERELL AND F. H. HAINES.

(Continued from p. 84.)

Limnophila cyclospila, n. sp.

Wing about 7 mm. long and 2.5 mm. broad, R_1 ending on costa at about level of end of discal cell; præfurca arising a short distance before middle of wing, running rather close to subcosta; second and third veins (branches of R) separating normally, the second two-branched, forming a very long cell with a very short petiole, the first submarginal being thus a little shorter than the second. A cross-vein from near end of R_1 to second vein (R_2), the first marginal cell longer than the second; discal cell unusually high, subquadrate, the basal corners approximately rectangular, the apex emitting three veins, the first forked, the fork somewhat longer than the stem, the second rather nearer to the first than to the third. Second basal cell much longer than first, its apex not far from the end of discal cell. Anal area reduced; axillary vein straight and close to margin. Wing yellowish with dark fuscous spots; elongate spots near base in costal, second basal, and first anal cells; three round spots successively larger and further apart on upper part of wing, the first above the light

interval in second basal cell, the second around the origin of the præfurca, and the third around the basal part of the first submarginal cell and extending in more diffused form to end of præfurca; the apex, region of discal cell and below it, and practically the whole of second basal and anal cells except a light interval towards the base strongly dusky; the lightest areas of the wing (appearing conspicuously whitish) are about the middle of the præfurca and the middle of the submarginal cells.

British Museum, I 9213. In having end of second basal beyond middle of discal cell this resembles *L. novæangliæ*, Alex., and *L. irrorata*, Johns. In having marginal cross-vein nearly at end of R_1 it resembles *L. lutea*, Doane. It is easily recognised by the beautifully spotted wings.

Dicranomyia undulata, n. sp.

Wing hyaline and immaculate, with fuscous veins, elongate, the apex being rather acutely rounded; length about 6 mm., width 2 mm. Auxiliary vein ending acutely on the costa very slightly before its middle, just before the origin of the præfurca. R_1 ending in a similar manner at level of discal cross-vein. The strongly-arched præfurca is given off from R at about the middle of the wing slightly beyond the level of the end of the auxiliary vein, and after a short course divides into the second and third veins, the fork being broad at base. Two marginal cells, divided by a very oblique vein directed backward from the second vein; the second marginal somewhat longer than the first. The third vein terminates at exact tip of wing, being curved somewhat downward before its end. Discal cross-vein present, somewhat oblique, reaching the fourth vein near its separation from the fifth, the fourth (M) and fifth (Cu) being connected for a short distance by anastomosis. The lower branch of the fifth runs out with a slight curve to the border. The sixth vein is straight, seventh vein with a double curve, the second very strong. The anal angle is well marked. The fourth vein is forked less than half way between the discal cross-vein and the apex of the wing, the fork broad. The first basal is longer than the second by the breadth of the apex of the second.

British Museum, I 9146. A peculiar species, remarkable for the open discal cell and short second basal. The absence of the vein separating discal cell from third posterior is very unusual in the genus, but Osten Sacken found this character in some specimens of *D. pupipennis*.

Dicranomyia excavata, n. sp.

♂. Length of body about 5 mm., ferruginous; wing 5.7 mm. long, 1.3 mm. wide, tinged with ferruginous, especially in the apical region; veins pale, ferruginous, R_1 ending about 1.3 mm. from tip of wing. Origin of præfurca not visible, owing to loss of a portion of the middle of the wing, but from the direction the visible part takes it is far beyond middle of wing, apparently about 2 mm. from apex; it is very short, soon dividing into the second ($R_2 + 3$) and third ($R_4 + 5$)

veins. Second simple, angulated at a little less than a third of its length, where it is joined to the end of R_1 by a long, oblique cross-vein, directed backward; terminal part of second straight, third before discal cross-vein strongly curved, its course beyond nearly straight, reaching tip of wing. Discal cell deep, six-sided, but its face on second basal very short; its apex emits three simple veins, the second a little nearer the first than the third. The base of the second and third posterior cells distinctly concave; second basal cell extending a little beyond corner of discal, its apical face oblique; sixth vein ending far from fifth, seventh (axillary) strongly curved downwards at end. Genitalia shown in figures.

British Museum, I 9946. Resembles *D. pudica*, O.S., but second basal cell as in *D. pubipennis*, O.S.

Gonomyia indecisa, n. sp.

Wing slightly over 6 mm, long. 1.7 mm. broad, hyaline, not reddened, with very pale yellowish veins; humeral cross-vein distinct. Costal vein deeper than usual, R_1 ending acutely on margin a short distance before forking of præfurca, auxiliary apparently absent. Præfurca strongly arched, originating about middle of wing, curving downwards to make a very broad marginal cell. The second vein forked, forming a widely open submarginal cell, the upper side of which is about twice as long as the stem and the lower side about twice as long as the upper; third vein ($R_4 + 5$) nearly straight, ending very slightly above the tip of the wing. Discal cell elongate and five-sided, emitting three simple veins from its apex, but the vein separating the third posterior cell from the discal is extremely weak and hardly visible, so that, without close scrutiny, the discal appears not to be closed; the second posterior has an angular base much shorter than the base of the third; second basal cell equal in length with the first, its apex scarcely beyond base of discal. Sixth vein widely separate at apex from fifth; seventh a little curved, entering margin a little before origin of præfurca.

British Museum, I 9087 (Brodie Collection). Rather like *G. affinis*, Brun., but R_1 very much shorter, second basal larger, and discal cross-vein not approaching fork of præfurca. Differs from the other Gurnet Bay fossil species by the closed (though indistinctly) discal, but especially by the much shorter R_1 .

Macromastix cladoptera, n. sp.

Wing 9.3 mm. long, 2.5 mm. wide, narrowing to a petiole basally, without any anal lobe, as in *Dolichopeza*; wing hyaline, apparently darkened along the fifth vein and the veinlets of the apical field, but there is a diffused iron stain on the fossil, which makes the true coloration doubtful. Apex very obtuse. Auxiliary vein not clearly visible, apparently entering R_1 near base; R_1 terminating a little over 2 mm. from tip of wing. Præfurca remarkably short, arising 3.5 mm. from tip of wing, forming a very acute angle, giving off the third ($R_4 + 5$) before middle of first marginal cell. Second vein ($R_2 + 3$)

simple, but emitting a very oblique rejected vein to subcosta very near its tip; third vein directed downward to a point just above apex of wing; discal cross-vein reaching discal cell very near base. Discal cell elongate, six-sided, having a very short face on fifth posterior cell, its face on first basal cell nearly twice as long as that on second basal, its oblique apex emitting only two veins, the first of which forms a wide fork, the stem of which is almost as long as its lower side; fifth posterior cell contracted just before apex, owing to the curve in the lower branch of the fifth vein (*Cu*), the basal corner of the cell only moderately produced. Sixth vein straight except at extreme tip, the anal cell not contracted apically; axillary vein straight except at extreme tip, remote from anal, running practically parallel with the margin.

British Museum, I 10397. The small upper section of second vein was thought to be absent, but on close scrutiny it can be seen, obscured by an iron stain. It is present in all the living species, but often colourless and very faint.

Styringomyia extensa, n. sp.

Length about 4.5 mm., width about 1.3 mm., hyaline, faintly yellowish, with very pale slender veins; costa with rather long delicate hairs. R_1 running into costa at an extremely acute angle near middle of wing; præfurca arising a little over a third from base of wing, strongly curved at base, but then running a straight course beyond end of R_1 , when it separates into second ($R_2 + 3$) and third ($R_4 + 5$) veins, which are both simple, the second directed obliquely upward, forming an angle of about 45° with costa and ending far before wing-tip, even before level of middle of discal cell; third extremely long, running a slightly arched course to a point above tip of wing. Discal cell extremely long and slender, the base on first basal oblique and equal to that on second basal, the apex emitting three simple veins, side on second posterior short, that on third posterior twice as long, very oblique, and slightly arched inwards; end of second basal cell oblique, taking the same direction as the end of first basal on discal. Sixth vein (A_1) straight, diverging from fifth and ending far from it; seventh (axillary) gently curved at end, terminating a short distance beyond origin of præfurca, but before level of end of R_1 .

Hooley Collection, 261. Differs from *S. ceylonica*, Edw., by having the axillary complete to margin, and lower side of second posterior cell all straight, as well as the longer discal cell. This is considerably larger than the *styringomyia* already recorded from Gurnet Bay, and differs in the details of the venation.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 35.)

Euplexia lucipara, L.—Abundant generally at sugar.*Phlogophora meticulosa*, L.—Common throughout the county.*Mormo maura*, L.—Kane states that this species is abundant at Corkhill; not uncommon locally among old willows near Lissan, Tullylagan and at Stewartstown.*Nenia typica*, L.—Abundant at grasses and sugar.*Helotropa leucostigma*, Hb.—Locally abundant in bogs and marshes; var. *fibrosa*, Hb., being fine and distinctly marked, varying from pale red to a dark red-brown.*Hydræcia* (*Gortyna*) *crinanensis*, Burrows.—A recently discovered species which seems only to occur in the North of England and Scotland, and in Ireland altogether replacing the familiar *nictitans* (so far as is at present known). Abundant and widely spread on marshy ground and stream sides, the imago resting on scabious and ragwort in the daytime, but more plentifully after dark. A very variable insect, the darker forms being more abundant near Lough Neagh. Mr. Kane (referring to the species then known as *nictitans*) remarks: "On the sandhills and fens which border the Wicklow coast I have found typical *nictitans* to be the almost exclusive form, and out of a series† sent to Mr. Tutt he only noted one var. *paludis*. On the other hand, I last year took a long series of nothing but var. *paludis*‡ except two var. *lucens* at Mote Park, Co. Roscommon. At Favour Royal I had a similar experience" ('Catalogue of the Lepidoptera of Ireland').*Hydræcia* (*G.*) *lucens*, Pierce.—Often abundant on moorlands and bogs, Altadiawan (K.), on ragweed near Cookstown (H.); at Lough Fea it frequents the bogs on the higher ground, but does not descend to the damp meadows alongside the lough, where the preceding species is found in abundance.*Hydræcia* (*G.*) *micacea*, Esp.—Abundant on waste ground almost everywhere; var. *brunnea*, Tutt, not uncommon.**Ochria ochracea*, Hb.—Prof. J. W. H. Harrison discovered the pupæ of this species in thistle stems near Cookstown.*Nonagria typhæ*, Hb.—Abundant generally in the county among *Typha*.*Tapinostola fulva*, Hb.—Common in marshes and damp meadows, the red (type) form not rare locally.† At the sale of Mr. Tutt's Collection this series, or a portion of it, was purchased by Dr. A. E. Cockayne, who writes ('Entom. Record,' vol. xxiv, p. 73) that the Rev. C. R. N. Burrows had examined the species, which consisted of eighteen *crinanensis* and thirteen *lucens*.‡ These specimens have since been identified as forms of *lucens*, and it is very doubtful as to the occurrence of *paludis* in Ireland.

**Calamia lutosa*, Hb.—Often abundant in reed beds near Grange and at Stewartstown; var. *rufescens*, Tutt, not rare in the former locality.

Lucania pallens, L.—Very abundant, a fine red form.

Lucania impura, Hb.—Abundant everywhere.

Lucania (Cirphis) comma, L.—Common and widely spread in the county in marshes; several ab. *suffusa*, Tutt.

Lucania (Sideridis) lithargyria, Esp.—Abundant at grasses; ab. *ferrago*, Fab., not uncommon.

Lucania (Chabuata) conigera, Fb.—Several captured at dusk by Prof. J. W. H. Harrison in lanes near Cookstown.

Grammesia trigrammica, Hufn.—Kane found this species scarce at Favour Royal; fairly common at sugar and light in this district; var. *obscura*, Tutt, by no means rare.

**Stilbia anomala*, Haw.—This species (which is generally rare inland in Ireland) is locally abundant on a small area of rocky moorland below Lough Fea; the males large and distinctly marked, and the females nearly black.

**Caradrina morpheus*, Hufn.—Rather rare at grasses locally near Stewartstown and at Killymoon.

Caradrina taraxaci, Hb.—Kane mentions Co. Tyrone as a locality for this species; abundant at grasses locally.

Caradrina quadripunctata, Fb.—Very abundant almost everywhere.

Petilampa arcuosa, Haw.—Generally abundant in the county in damp localities, varying from white to a brown-banded form.

**Rusina tenebrosa*, Hb.—Not uncommon locally at sugar, at Lissan and near Killymoon; at bladder campion at Grange.

**Amphipyra pyramidea*, L.—This species seems to have considerably extended its range in this country in recent years, as Kane states that “single specimens at Howth and Lissadell, Co. Sligo, mark its northern limits on the east and west”; in this district it is often common at sugar in woods near Killymoon and at Loughry; also at Stuart Hall, where a fine dark-banded form occurs.

Amphipyra tragopogonis, L.—A very common species.

**Panolis piniperda*, Panz.—Not very abundant; several at Killymoon and Tamnamore, of a dull red form.

Pachnobia rubricosa, Fb.—Favour Royal (K.); often abundant at sallows near Lough Fea, where grey and brown forms are common; always rare in cultivated districts.

Teniocampa gothica, L.—Abundant at sallows; var. *gothicina*, H. Sch., at Lough Fea.

Teniocampa stabilis, Hufn.—Abundant generally, varying from pale grey to a brownish black.

Teniocampa incerta, Hufn.—Common in woodlands. The following aberrations occur: abs. *instabilis*, Fab.; *cærulescens*, Tutt; *nebulosus* and *fuscatus*, Haw.

Teniocampa munda, Esp.—Locally abundant at Favour Royal (K.), also at Killymoon, near Stewartstown, and in the Lough Neagh district, the prevailing form being *ab. rufa*, Tutt, although *abs. pallida* and *grisea*, Tutt, are common.

**Teniocampa opima*, Hb.—Locally common at Lough Neagh; a few near Stewartstown; var. *brunnea*, Tutt, not rare in the former locality.

Teniocampa gracilis, Fb.—Abundant generally in damp localities; var. *rosea*, Tutt, almost as common as the pale form; a banded aberration of the latter has the median area suffused with dark scales, several approaching var. *rufescens*, Cockl.

Calymnia trapezina, L.—Kane gives Favour Royal and near Stewartstown as localities for this species; it is also not uncommon near Tamnamore and at Killymoon, where reddish varieties occur.

**Dyschorista suspecta*, Hb.—Locally common at heather blossom near Tamnamore, and at Killymoon on ragwort, in the forms *congener*, Hb., *rufa* and *nigrescens*, Tutt.

**Cirrhœdia* (*Atethmia*) *xerampelina*, Hb.—Not abundant; a few at rest on ash trunks near Stewartstown; several at street lamps, Dungannon.

Amathes (*Orthosia*) *lota*, Clerck.—Common at ivy bloom.

Amathes (*O.*) *macilenta*, Hb.—Abundant at sugar and ivy bloom.

Amathes (*O.*) *circellaris*, Hufn.—Very abundant.

**Amathes* (*O.*) *helvola*, L.—Very rare at sugar; Killymoon.

Amathes (*O.*) *lychnidis*, Schiff.—Abundant at light and ivy blossom; *ab. ferrea*, Haw., the most common form.

Xanthia lutea, Strom.—Common at ragwort and honey-dew on willows.

**Xanthia fulvago*, L.—Almost as abundant as the last; all of a pale yellow, not orange; var. *suffusa*, Tutt, not uncommon at Killymoon and near Tamnamore.

Orrhodia (*Conistra*) *vaccinii*, L.—Abundant at ivy bloom; less common at the willows in the spring.

Orrhodia (*C.*) *ligula*, Esp.—Very scarce at Favour Royal (K.).

Eupsilia (*Scopelosoma*) *satellitæ*, L.—Abundant at ivy and sugar.

Lithophane (*Xylina*) *socia*, Rott.—Locally abundant at sugar and ivy and at willow bloom; var. *umbrosa*, Esp., not rare.

Xylocampa areola, Esp.—Common at willows, also at Favour Royal (K.); several *ab. rosea*, Tutt.

Calocampa exoleta, L.—Common at ivy bloom and sugar, and also at Favour Royal (K.); several without dark suffusion on inner margin of fore wings.

Calocampa vetusta, Hb.—Generally abundant in the form *ab. brunnea*, Tutt.

Cucullia umbratica, L.—Generally common at flowers and at rest on willows.

Anarta myrtilli, L.—Common on moorlands and bogs; dark forms at Altadiawan (K.), also near Lough Fea.

**Hydrelia (Erastria) uncula*, Clerck.—Locally abundant near Tamnamore, Lough Neagh, flying freely in the afternoon sunshine.

Rivula sericealis, Scop.—Abundant in damp meadows.

Gonopterinae.

Scoliopteryx libatrix, L.—Common in the autumn and in the spring after hibernation, at sugar.

Quadrifinae.

Plusia chrysitis, L.—Common and widely distributed, several examples of the type with the metallic colour divided by the median brown band.

**Plusia bractea*, Fb.—Sometimes not rare at flowers at Lissan and Tullylagan; an example found on *Lamium* by Prof. Harrison near Cookstown; flies in the afternoon sunshine as well as at dark.

Plusia festucae, L.—Most abundant in this district at flowers; several with the metallic spots connected together, forming one central golden blotch; ab. *juncta*, one example, has the spots confluent on one fore wing and divided on the other.

**Plusia iota*, L.—Locally not uncommon, and var. *percontationis*, Fr., occurs. Localities: Lissan, near Cookstown (H.), Lough Fea, near Stewartstown, and at Lough Neagh.

Plusia pulchrina, Haw.—Abundant, varying from a pale salmon colour to a deep purplish red, and often with a bright orange patch below the Y mark.

Plusia gamma, L.—Not very common, except occasionally in the Lough Neagh district, where it sometimes abounds at mint flowers.

Plusia interrogationis, L.—Kane found this species not rare at Altadiawan; often abundant over the heather near Lough Fea; at Killymoon it occurs on an isolated area of bogland which has been preserved from the general destruction by peat cutting; the species taken here are very dark, and without the beautiful purple tint of the moorland form.

**Abrostola triplasia*, L.—Locally abundant at Lissan, Lough Fea, and near Stewartstown; larvæ on nettles near Cookstown (H.).

Abrostolla tripartata, Hufn.—Abundant and widely spread, although Kane found it rare at Favour Royal.

Euclidia mi, Clerck.—Local at Favour Royal (K.), and also near Tamnamore.

ERRATUM.

Vol. liii, p. 277, line 3, for *L. deplana* read *L. complana*.

(To be continued.)

COLLECTING IN 1918 AND 1919 IN GLOUCESTER-SHIRE, ETC.

BY C. GRANVILLE CLUTTERBUCK, F.E.S.

IN 1918, the last and most critical year of the war, my volunteer duties seriously curtailed my spare time. Easter was devoted to a musketry course, and, having obtained a First Class Instructor's Certificate, I was one of those selected to take a class which met two nights a week and carried on until the middle of June. Added to which the claims of an allotment still further interfered with field work, although it supplied me with a few interesting captures. The following were the most noteworthy species secured: *Depressaria capreolella*, March 21st on the wing in the sunshine, Forest of Dean; *Cheimophila* (*Dasytoma*) *salicella*, males flying freely round a willow tree on roadside in the morning of March 24th; *Polyphlocaridens* emerged April 6th, larva beaten from oak June 16th, 1917; *Ornix favigora*, on the wing on Cotteswolds, May 5th; *Tortrix* (*Sciaphila*) *virgaureana*, emerged June 15th, larva found on our hills feeding on flowers of *Anemone pulsatilla*, May 9th; *Lithocolletis oxyacanthæ*, on wing in garden, May 13th; *Coleophora alcyonipennella*, netted in a wood near Gloucester, May 16th; *Sesia formiciformis*, in numbers, settling on flowers of dewberry, black bryony and comfrey in an osier bed, June 2nd; *Acrolepia perlepidella*, beaten out of small-leaved lime (*Tilia cordifolia*) in Leigh Woods, June 6th; *Brenthis selene*, *Chrysophanus phloxæ*s and *Sesia bombyliiformis* (narrow bordered), at flowers of dewberry, Forest of Dean, June 12th; ♀ *Eriogaster* (*Bombyx*) *rubi*, detected by my wife amongst grass on our hills, June 13th; *Coleophora lineola*, amongst *Ballota nigra* near my allotment, June 20th; *Mompha propinquella*, on our hills, June 29th; *Epinotia* (*Trycheris*) *aurana*, on flowers of *Heracleum sphondylium* on a hilly roadside, July 4th; *Tinea albipunctella*, taken on a road near Gloucester, July 5th; and *Polygonia c-album*, var. *Hutchinsoni*, netted in my garden, July 9th.

In North Devon, between July 26th and August 13th, the following species were noted: *Nepticula trimaculella*; *Macroglossa stellatarum* (at flower of *Echium vulgare*); *Stenia punctalis*, *Triphæna interjecta* (on the wing in the afternoon); *Eucosma* (*Pædisca*) *profundana*, *Scoparia truncicolella* (beaten from alders on the bank of a stream); *Aristotelia* (*Apodia*) *bifractella* (on flowers of *Inula conyza*); *Pyrameis cardui*, *Epinephle jurtina* (bleached variety); *Eupæcilia atricapitana* and *Catoptria pupillana*. A large black fly, bearing a wonderful resemblance to a humble bee, was taken on August 12th and identified by Mr. Claude Morley as *Echinomyia grossa*, L. A brilliant, metallic, copper-coloured gall-fly, taken at the same time, was identified as Chalcid—*Torymus regius*, Nees.

On August 15th I was pleased to meet with *Cataplectica* (*Æcophora*) *fulviguttella* for the first time on the Cotteswolds in company with *Laspeyresia* (*Semasia*) *janthinana* at flowers of *Angelica*. On the 29th I cycled to Ganarew and back, twenty-five miles each way, and was rewarded by a sight of part of Mr. A. B. Farn's wonderful collection of butterflies. Really, one has no idea of the range of variation in our native Lepidoptera until one is fortunate enough to get a view of a truly great collection like my friend's. On September 12th *Swammerdamia heroldella* began emerging from pupæ brought from Devon. On the 17th a ♀ *Lasiocampa* (*Bombyx*) *quercus* emerged from a pupa resulting from a larva found in Devon in August, 1917. On the 28th a fine fresh specimen of *Chrysophanus phleas* flew into my wife's market-basket in the middle of the City of Gloucester and was easily captured. A specimen of *Vespa crabro* visited my house on October 1st for the first time in fourteen years' residence. A ♂ *Asteroscopus sphinx* (*cassinea*) and a ♂ *Hybernia defoliaria* was taken on a gas lamp, October 25th.

The year 1919 will always be memorable to me owing to the discovery near Gloucester of a locality for the rare plume *Pselnophorus brachydactylus* (see 'Entomologist,' vol. lii, p. 274) and the capture of a new form of *Plusia pulchrina* (see 'Entomologist,' vol. liii, p. 1). I credit these captures first of all to the spirit of emulation fostered by a sight of Mr. Farn's glorious collection, and secondly to the visual training I had as a volunteer, for both species were detected at rest by sheer quickness of vision. A bad attack of 'flu in February took some of my energy, but a fine summer acted as a good tonic and I was able to add a few species to both the Gloucester and Devon County lists. The day spent on our hills in June with Mr. Rowland Brown (see 'Entomologist,' vol. lii, p. 174) will live in my memory as a "red letter day." It was delightful to have the company of one so well known in the entomological world and to listen to his collecting experiences in foreign climes, and above all to have the great pleasure of introducing him to the Cotswold *Arion*.

During an Easter visit to Swanage I captured a hibernated specimen of *Epermenia chærophyllella* in a garden (April 17th), whilst at Lulworth Cove flowers of Common Alexanders (*Smyrmium lustratum*) were picked, and on the return journey a ♂ *Xanthorhoe multistrigaria* was taken in the train near Chedworth Station on the Cotswolds. *Acompsia* (*Æcophora*) *tripuncta* was taken for the first time just outside a small wood near Gloucester, where several nightingales were singing during the evening of May 30th. Larvæ of *Saturnia pavonia* (*carpini*) in two stages of growth were found by one of my daughters feeding on meadow-sweet in our seed beds, June 13th. The next day on our hills a ♀ *M. stellatarum* was observed busily ovipositing on the flowers

of White Bedstraw in the afternoon. June 28th, near our osier beds at 9 p.m., I netted a fine specimen of that beautiful Tinea, *Aristotelia hermannella*, a species apparently new to our county list. July 12th a larva of *Calocampa exoleta* was feeding on seeds of dock on a hilly road-side, a fine ♂ being reared October 3rd. *Mompha conturbatella* was found amongst *Epilobium angustifolium* (July 24th), and *Sophronia semicostella* beaten from a hedge (July 26th) on our hills, both species so far as I know being new records for Gloucestershire.

During a seaside holiday in North Devon, from August 2nd to the 22nd, my most noteworthy captures were *Gelechia (Lita) fraternella* on the 8th and a fine ♂ *Agriades corydon* at the back of the sandhills on the 15th. These species do not appear to have been recorded from Devon before.

I also found *Plebeius ægon* amongst heather on the downs, but, according to the 'Victoria County History,' it has only hitherto been recorded from South Devon.

In conclusion, my grateful thanks are due to Mr. E. Meyrick, F.R.S., for kindly naming most of the micros, and to Mr. Claude Morley, F.E.S., for identifying the flies.

23, Heathville Road,
Gloucester.

NOTES ON THE SEASON OF 1920 IN WEST SUSSEX.

By C. M. WOODFORD.

On March 8th, a fine sunny day, *Eugonia polychloros* was seen on a window in the house. This species has hibernated in the house on a former occasion. From March 19th to 23rd the weather was bright and warm, and *Gonepteryx rhamni*, *Aglais urticae*, *Eugonia polychloros* and *Vanessa io* were observed on each day. On March 23rd a single male *Euchloë cardamines* was seen, and on 28th *Pieris rapæ*. On March 31st my diary records the capture of four *Euchloë cardamines* ♂, and an *E. polychloros* ♀ was captured and liberated. From April 1st to 22nd the weather was dull and cold and the emergence of everything was retarded. On April 23rd the first female of *E. cardamines* was observed; just a month after the appearance of the first male. It was not until May 7th that *Pieris napi* was seen, and on May 11th *Pieris brassicæ*. On May 12th, the weather having set in fine and warm, *Nisoniades tages* was out in abundance, and one individual of *Chrysophanus phleas* was seen. On this date a single *Pyrameis atalanta* was observed settling on the roadway of a lane near a clump of nettles. The same individual, indentified by a peculiarly damaged wing, haunted the same spot daily until June 16th, a period of over a month. On May 14th

Pararge megæra was observed, and on 15th *Hesperia malvæ*, *Nemeobius lucina*, *Callophrys rubi*, and *Brenthis euphrosyne* were taken, and *Pyrameis cardui* seen. *P. cardui* was again seen on 16th and 19th, and on June 2nd.

On May 22nd *Cænonympha pamphilus* was seen and on 23rd *Polyommatus icarus*. On May 31st *Brenthis selene* was taken, but it was not fully out until a week later. *C. rubi* was still on the wing, but in poor condition on June 6th, and a belated female *E. cardamines* was seen on June 7th, and the last *Nemeobius lucina* on June 11th. A male *Epinephele jurtina*, freshly emerged, was taken in the grass on June 14th, and the last male *E. cardamines* was seen on the same date. On June 15th *Augiades sylvanus* was seen, and on 16th one was captured. By this time *E. jurtina* was fully out.

A note in the diary on this date refers to the ravages occasioned to the oak-trees for the third year in succession by the larvæ of *Tortrix viridana*. Rooks in flocks and other birds were now preying upon the pupæ rolled up in the oak-leaves. The first perfect insects were observed on June 13th, and by 16th they were flying in thousands. On June 18th *Argynnis cydippe* was observed, and one specimen in beautifully fresh condition was taken. Also *Aphantopus hyperanthus* freshly emerged. *B. euphrosyne*, very much worn, was still flying at this date. *P. atalanta* and *P. cardui* were seen, also *G. rhamni*, very late. On June 19th a single *C. rubi* in worn condition was taken, and liberated. On June 23rd two *P. cardui*, in poor condition, were seen on the Downs. On the same day *Limenitis sibylla* freshly emerged. Two days later it was out in quantity. *B. selene* was seen for the last time on June 28th. On June 30th *Dryas paphia* was seen and taken, also *Pararge egeria* (*egerides*), second brood.

July set in wet and cold and until 13th of the month nothing was seen. At that date *L. sibylla* was much worn, having evidently suffered from the weather. *A. urticæ*, freshly emerged, was seen, also *Epinephele tithonus* ♂, and *Adopæa flava*. On July 17th *L. sibylla* was sought for in vain in its favourite haunts: a contrast to the previous year when it continued on the wing up to the first days of August. On July 20th *Argynnis aglaia* was seen for the first time, and *Agriades corydon*, freshly emerged. On July 29th *P. atalanta*, newly out, was observed, and from this date onwards to the end of the season has been particularly plentiful. *Celastrina argiolus* was sought for in vain at a particular holly hedge where in previous seasons it has been plentiful at this date. On the same day *P. megæra*, second brood, and *P. icarus*, second brood, were observed. The first female of *E. tithonus* was also observed, all seen and taken hitherto having been males. *Hipparchia semele* was fresh out at the same time. On August 3rd *A. corydon* was fully out on

the Downs in numbers. *P. cardui*, freshly emerged, and *Colias edusa* were seen for the first time. On August 5th *Aricia medon* second brood appeared. *G. rhamni* was noticed on 7th. On August 9th *A. cydippe*, in battered condition, was taken, and on August 13th *D. paphia* in fair condition still, with *P. egerides*, third brood, newly emerged. On August 16th between twenty and thirty *C. edusa* were seen and five taken. On August 27th *A. bellargus* was freshly out. September 1st *C. edusa* still fairly plentiful. September 9th *A. aglaia* seen and taken in fair condition although a very late date. September 14th *P. egerides*, fourth brood, taken. Another seen on September 23rd. October set in wet and windy, but the weather improved after the first week. *P. atalanta* was particularly abundant on the flowers of scabious. *C. edusa* could be seen at any time by visiting the locality it frequented, and from which it did not appear to stray.

C. pamphilus and *P. rapæ* were seen for the last time on October 7th, and *E. jurtina* on October 14th. A belated *P. icarus* was taken on October 18th. On October 23rd a large dragon-fly, *Æschna cyanea* ♂, was taken. *P. atalanta* had not been seen since October 11th, and those seen were much worn and damaged, but on October 24th, a beautifully fine day after a foggy morning, two perfectly freshly emerged specimens, with all the bloom upon them, were taken upon the flowers of garden scabious. There can be no doubt as to their recent emergence, as one emitted a drop of the red fluid peculiar to freshly emerged specimens, in the box in which it was confined. On October 25th *P. atalanta* and *P. cardui* were seen and *C. edusa* taken, also a dragon-fly, *Sympetrum striolatum*. On 26th, 27th and 28th *A. urticæ* was seen in the garden. On October 29th *C. edusa* was seen and a male *P. icarus*, in passable condition, taken. On October 30th *P. atalanta* was seen for the last time. On October 31st the weather changed to dull and cold and hopes of taking a November *edusa* were abandoned. Twenty specimens of *C. edusa* were taken in all—all males with one exception.

No striking aberrations were met with. Of thirty-two *C. phlæas* taken, seven were referable to ab. *cæruleopunctata*. Of twelve *V. io*, three were ab. *cyanosticta*. One very dwarf *P. napi* was taken, measuring only 32 mm. across the wings. Of a long series of *E. cardamines* the largest female measured 46 mm., and the smallest male 33 mm.

Wednesday, November 17th, was a beautifully fine, sunny day, without wind after a hard frost. *P. atalanta* was seen flying in the sunshine at 11.30 and *G. rhamni* two hours later.

The Grinstead,
Partridge Green,
Sussex.

NOTES ON LEPIDOPTERA AT ALTON IN 1920.

By E. A. C. STOWELL.

THE vicissitudes of the weather produced some erratic appearances among the butterflies. February and March were very warm. *Vanessa io* appeared on February 10th by the roadside, but the most surprising dates were *Celastrina argiolus* on March 30th, and *Euchloë cardamines* March 31st. Then the season collapsed. The only further sight I had of *C. argiolus* was on May 15th and September 7th—an odd set of dates! The species was common last year, but I fear this was one of the fatal seasons that give it a set-back. In April I spent a week in the Isle of Wight, and found larvæ of *Melitæa cinxia* swarming near Niton, but very hard to rear. About three dozen larvæ brought home only yielded eight imagines. There were no parasites that I could observe, but both larvæ and pupæ dried and shrivelled up. Yet their habitat on the undercliff is hot and dry enough.

The Vanessids promised well. On May 16th, during a Sunday afternoon stroll, I encountered *Aglais urticæ*, *V. io*, *Pyrameis cardui* and *P. atalanta*, while something looking like *Eugonia polychloros* flew over a tall barn; I met also the three common species of *Pieris*, *Gonepteryx rhamni* and *E. cardamines*, a most unusually complete list for the date. *P. atalanta* was the butterfly of the year, often seen in June and abundant in September, while a fresh-looking specimen was brought me, caught before 9.0 a.m. on November 9th.

P. cardui was not common in the autumn, and I saw nothing of *A. urticæ* till on October 7th a fresh-looking specimen appeared in the garden. Presumably the second brood was much belated. *V. io* was fairly common in the autumn; in my experience it has been commoner of late years than *A. urticæ*.

The woodland butterflies were normal in date, but fewer in number than last year. I noted *Brenthis euphrosyne*, May 22nd, *Nemeobius lucina*, May 23rd, *B. selene* (not fresh) and *Limenitis sibylla*, June 23rd. The larvæ of the latter must have been abundant in spring, as I picked up three in a few minutes on April 24th in the Holt, though not out to look for them. They are remarkably accommodating larvæ. I left them in the glass-topped metal box, fed them on the "netted" Japanese honeysuckle; they suspended from the glass and emerged the first week in June—fine specimens, though I had to raise the lid of the box to make room for their wings to expand. The pupa of this species is incredibly small to contain such a large butterfly.

I bred six *Zephyrus betulæ* from as many larvæ beaten on June 7th, but could only see one wild imago (August 30th). *Melanargia galatæa* and *Argynnis aglaia* were out on July 4th. *Dryas paphia* was not out on June 30th, fairly plentiful at the end of July, and I captured a male for identification at Selborne on September 3rd.

A second brood appearance, unexpected in such a season, was made by a solitary *Nisoniades tages* on September 3rd.

Colias edusa was first seen on August 10th at Corfe Castle (where I also procured some *Adopæa actæon* on a dullish day). Several odd specimens were seen about Bournemouth, but I think this species dislikes heaths, and does not alight on heather. I saw it also from the train near Winchester, on August 27th, and twice at Alton in September. *Agriades corydon* was out on August 10th at Corfe, and quite fresh males on September 3rd in its very limited habitat at Alton. *Pararge egeria* I only saw once (Oakhanger, September 11th). *P. megera* was about as usual—not common here.

On a sunny afternoon in October I observed with interest the different hibernating practices of two species. *A. urticae* was flying frantically round and over the house, evidently searching for a suitable cranny as a refuge. *G. rhamni* fluttered up from a flower, settled on an ivy-leaf without the least investigation, and stayed there for the night. I noticed the same want of pre-meditation in this species in the autumn of 1915, when it flew to a leaf and stayed there for weeks. There is no attempt to get well inside, or, out of sight, and little reconnoitring or selection. On the other hand, I watched *P. atalanta* retire for the night into a holly bush, with a considerable amount of fuss, and it finally got well inside. It has been noted that Vanessids seem to be gregarious in hibernation. I doubt if this is intentional, but they reconnoitre the neighbourhood very thoroughly, and the same cranny or window eventually strikes the insect mind as suitable, for some reason not clear to us. During the two summers I have been here I have noted forty species of *Rhopalocera* within a radius of six miles. I think this is a pretty good record.

(To be continued.)

NOTES AND OBSERVATIONS.

SATYRUS HERMIONE IN MACEDONIA, AND SOME OTHER BALKAN BUTTERFLIES.—In my "Supplementary Note on the Butterflies of South Macedonia," published in the May number of the 'Entomologist' (vol. liii, pp. 106-109), I noted the absence of *Satyrus hermione* from the reports of the several collections reviewed and discussed. I have again been through the various captures kindly given me by Capt. P. J. Barraud, and find I have two very fine pairs of this butterfly labelled "Saracli, June 26th, 1917." Soon after the paper appeared I received a very interesting communication from Major P. P. Graves, then at Constantinople, commenting on some of the species enumerated, and criticising the records cited for the Central Balkan and Bulgaria. He first drew my attention to my identification of *Chrysophanus thetis* in the Natural History Museum Collection, and I do not think, in view of his remarks, that it would be safe to retain this beautiful Copper in the list on the strength of a single (and perhaps inaccurately identified) specimen. "It had

seemed to me," he wrote, "confined to pine and cedar-wooded areas" of the Veluchi (Greece), and certain parts of Northern Asia Minor and the Lebanon. With regard to *Cænonympha dorus* (so common in S.E. France) in the Central Balkan reported by Bachmetjew, and also *Agriades escheri*, neither is quoted with authority by Rebel ('Cat. Lep. d. Balkanlander'). At all events *escheri* is included as a doubtful, and from information recently to hand from Dr. Verity it would appear as though the distribution of this "Blue" is not extended south of the Central Alps, east of Botzen. Major Graves also points out that Batchmetjew's *Epinephele ida* is not supported by Rebel, though I find it reported from Valona in Southern Albania (or is it in New Greece now?), and of course, it occurs abundantly in Corfu, and at Zara and Spalato on the Eastern Adriatic coasts. The omission of *Hipparchia briseis* from Capt. Barraud's "Notes on Lepidoptera, etc," ('Entomologist,' vol. li, p. 88, 1918) is accidental. I have an example of exceptional size, obviously referable to var. *major*, Oberthür, taken by him at Paprat in June, 1918, and it is stated by Mr. Mace ('Entomologist,' vol. liii, p. 103, 1919) to have been seen in June and again in autumn, though not unduly common. This last record, I assume, denotes an extended emergence rather than the occurrence of a late autumnal second brood, for I know of no *Satyrus* or *Hipparchia* north of the Mediterranean or at all which is double-brooded. That the flight of the Satyrids of these groups may be prolonged well into the autumn I have proof, for I find from my diary that *Satyrus circe*, which first appeared in the Alpes-Maritimes in mid-June, was still on the wing at Beaulieu, A.M., when I was there in 1902 on October 9th.—H. ROWLAND-BROWN; Harrow Weald, March 14th, 1921.

BUTTERFLIES OF NOTE OBSERVED AROUND TRING.—Having given my time entirely to butterflies around Tring for the last four years, a few notes on the rarer ones may be interesting. *Pieris rapæ*: I took a very curious ♀ flying along a road in June, 1920. All wings of a deep creamy tint without any of the usual spots, also a very deep yellow ♀ bred from Tring larvæ. *Leptosia sinapis*: Of this local species I had the good fortune to capture a ♂ in a wood near by in 1919. Not seen since. *Colias edusa*: Odd examples to be found nearly every year. Five specimens last August. *Gonepteryx rhamni*: A crippled ♀ bred from ova, 1920, has the underside streaked with brownish-red. Another specimen presented to me has the fore wing tipped with red. Taken at High Wycombe. *Brenthis euphrosyne*: Several males last year with the usual silvery spots replaced by dull leaden-blue. Also a ♀ approaching creamy. *Argynnis aglaia*: I took a pure white example in July, 1917, near Halton, Bucks. Seen several days before I netted it, when half its hind wing was missing. *Dryas paphia*: A few last year in the woods. Very scarce round here, although I took a fair number of ♂♂ in 1919 but left the ♀♀. *Melitæa artemis*: Very much to my surprise I took nine specimens last year, never having seen it before, some just in Bucks and others well in Herts, these being much larger and brighter. *Euvanessa antiopa*: This specimen was recorded by my father. Taken in an old boot by my friend, who gave it to me in 1917 ('Entomologist,'

* 'Ann. Nat. Hist. Hof. Mus. Wien,' xxvii, pp. 281-334, 1913.

October, 1917, p. 235). *Aglais urticae*: Two very pale examples, one almost white, both of which I took in the same field in 1918 and 1919. *Melanargia galatea*: One specimen, difficult to describe, with the black patches distributed very irregularly. I took it last year on Bucks Chilterns. *Epinephele jurtina* (*janira*): Several bleached ♀ ♀ last year; ♂ ♂ partially so. *Pararge megera* and *P. egerides*: Both these are now well represented, but prior to 1918 I had not found them. *Cæonympha pamphilus*: My best aberration may be included here. I took it on the hills near Aldbury in June, 1918. All wings of a dull mahogany-brown; gives the appearance of the next species.* The underside is a very rich deep brown. Last year several bleached examples, and a curious one having three wings normal and one pure white. *Chrysophanus phlaeas*: Two specimens with all wings pale metallic yellow, in same field, curiously enough, where I took the pale *urticae*. *Aricia medon*: An obsolete underside last last year on Bucks Chilterns. *Agriades corydon*: Several *semi-syngrapha* near Halton and Aldbury last August. Two somewhat striated undersides and a *semi-obsolata* in 1919 and a grey ♂. *Cupido minimus*: Out of hundreds examined, one obsolete underside, Bucks Chilterns, 1920. *Nisoniades tages*: A very remarkable aberration last year at Dancer's End. All wings of a pale straw, one side being almost white. I would like to know if any of your readers have seen other brown specimens of *pamphilus* as I find no mention of it in my books.—A. L. GOODSON; Park Road, Tring, Herts.

ZEPHYRUS QUERCUS AB. OBSOLETA.—As varieties of *Zephyrus quercus* seem to be very rare, it will perhaps be of interest to mention that I took a ♀ of this insect at Arnside, Westmorland, on August 18th, 1920, in which the usual blue patch is almost completely absent, being represented only by a few scattered blue scales, almost invisible at a casual glance. It seems to be referable to ab. *obsolata*, Tutt, of which the latter only records one specimen, bred by Mr. Raynor at Hazeleigh.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan.

PIERIS RAPÆ, AB.—During July and early August of last year I took a fairly long series of *Pieris rapæ* at Finchley, and on examination after they were set I discovered among the females a form having a blackish-grey spot in the discal area of the hind wings. I found four examples of this aberration in the series of forty-two females I had set—roughly 10 per cent. Two of the four have the spot well-developed and distinct; the other two have it indicated by a cluster of black scales. This spot is situated between veins 3 and 4, and is placed about one-third the distance up from the margin to the base of the wing. I notice the specimens bearing this spot have the other black markings somewhat heavier than normal summer females. I exhibited these specimens at the South London Entomological and Natural History Society on October 14th last, and since then two of the members have told me they have looked through their series and found they had examples similar to mine. As far as I am able to trace this form does not appear to have been described or named, and as it seems to be an aberration that is not uncommon I suggest it should be called *nigropunctata*. Since writing the above I find Mr. Frohawk gives a very excellent figure of this form in his 'Natural

* Dark form of *C. tiphon* (*darus*).

History of the British Butterflies'; the figure is to be found at the top of the left-hand column of p. 93 of 'The Field' dated January 16th, 1915.—B. S. WILLIAMS; 77, Durham Road, East Finchley.

RUMICIA PHLEAS AB. CUPREOPUNCTATA, TUTT.—I took a splendid example of this uncommon form of *phleas* at Finchley during August of last year. The copper spots on the hind wings (which occupy the same positions as the blue spots in the well-known form *caeruleopunctata*) being bright and metallic, although not quite so brilliant as the hue of the fore wings; the bases of the hind wings also have a most marked copper sheen or gloss spread over them. At the same time I took a freshly emerged example of ab. *subradiata*. Tutt.—B. S. WILLIAMS; 77, Durham Road, East Finchley.

EARLY APPEARANCE OF PIERIS RAPE.—On February 16th a freshly emerged male of *Pieris rape*, L., was taken on the wing at Letchworth, Herts. This is a remarkably early date, and it may be noted that the average date for twenty-five years as given in the Royal Meteorological Society's Phenological Report for 1920 is April 20th. The above-mentioned specimen was exhibited at a meeting of the Letchworth and District Naturalists' Society held at Letchworth Museum on March 15th, 1921.—RAY PALMER, F.E.S.; Ingleholme, Norton Way, Letchworth.

EARLY APPEARANCE OF DREPANA LACERTINARIA.—On March 26th, whilst "kicking" the trunks of trees for *Coccyx fimbriaria* on Chislehurst Common, a male *D. lacertinaria* was dislodged from a birch tree. No doubt the exceptionally hot sun on the previous day (Good Friday) had caused the early emergence of this species.—LEONARD T. FORD; St. Michael's, Bexley.

DIANTHOCIA ALBIMACULA, BORKH., IN SUFFOLK.—Some time ago I received, through the kind medium of Mr. J. Ray Hardy, a fine female example of this beautiful and very local species, quite typical in marking, colour, and general appearance, which had been captured close to Stowmarket. Hitherto, so far as the British Isles are concerned, it has occurred (a) in Kent, where in 1816 the original specimen was found at Birch Wood, and subsequently at Folkestone and Dover. There, so far as my own experience lies, its larva seems to feed exclusively upon the seed-capsules of *Silene nutans*, L., and its variety *paradoxa*, Sm., locally known as the "Dover" Catchfly. In South Hants it has (b) been noted, but only once, near Gosport, and (c) in South Devon at Seaton and, more recently, Axminster district. This single instance, therefore, so far north of these known localities, and in an inland station, is of particular interest, and it is to be hoped that now attention has been drawn to its occurrence in the east of England more examples may be found, so that the species may be recognised more fully as a true native there. Upon referring to the 'Flora of Suffolk,' compiled by my late friend the Rev. Dr. W. Marsden Hind, formerly incumbent of Pinner, Middlesex, and subsequently Rector of Honington, near Eye, I find that *Silene nutans* has only once been recorded as a casual, at Ipswich, but this county possesses a smaller Catchfly (*S. otites*, Sm.) hardly found outside it in the British Isles, peculiar to the "Breck" sand district between Tuddenham, Brandon and Mildenhall, which overlies the chalk, and *albimacula* might possibly occur there. This district is some

twenty-four miles west of Stowmarket, that town, however, being situate also on calcareous soil. The common Bladder Campion (*Silene inflata*, Sm., vel. *Cucubalus*, Auct.) seems as abundant as elsewhere in Suffolk, and this may have become the food-plant of the larvæ, through lack of more congenial pabulum.—J. COSMO MELVILL; Meole-Brace Hall, Shrewsbury, April 10th, 1921.

POINTING ENTOMOLOGICAL PINS.—With regard to the difficulty of pointing pin wire, mentioned by Mr. W. G. Sheldon ('Entomologist,' April, 1921, p. 99), I had occasion some years ago to sharpen some "cabinet points" for labelling purposes. The "points" as sold were absolutely useless, bending at right angles if one tried to pierce the label. I found the simplest way to put on proper points was to use the little fine-grain emery wheel supplied with some sewing machines for re-pointing broken needles. The stitching mechanism is first disconnected, and then the emery-wheel device can be run off the driving wheel by means of a rubber-rimmed pulley. I found difficulty in holding the wires, and managed best with a short length of very fine tubing let into a handle. With a long length of wire this could be passed right through the tube and the pins cut off as sharpened, the tubing acting as a tool holder. Probably a small drier holder or fly-tying vice would answer, or even a couple of stout matches slightly grooved and bound with thread, the wire being first placed between the matches, and drawn out so that about $\frac{1}{4}$ in. projects at each sharpening. The difficulty is to hold the wire firmly whilst sharpening is in progress, and also to rotate it evenly.—G. BERTRAM KERSHAW, M.Inst.C.E.; 9, Victoria Street, S.W. 1.

CNEPHASIA COMMUNANS, H. S., IN SURREY.—In the year 1890 I took a single example of this species near here, but although I have repeatedly hunted for it since, success has not been mine until last year. I am aware, of course, that, as reported in 'E.M.M.,' xli, p. 260, Mr. Thurnall captured a number of specimens in the Croydon district in 1904. On May 24th last, however, I found the species common in the Dorking district some twenty miles away from here.—W. G. SHELDON, Youlgreave, S. Croydon.

HEMEROBUS STIGMA, STEPH. (NEUROPTERA), IN JANUARY.—It may interest those who collect in the winter to hear that this little "Lace-wing" was taken flying at Esher Common, Surrey, on January 13th and 24th, 1921, while a fair number fell into the beating-tray from the small scotch firs on January 30th.—W. J. LUCAS.

THE COMMON CRICKET SWARMING IN A REFUSE DUMP.—Mr. W. J. Lucas, in his interesting "Notes on British Orthoptera, 1920" ('Entomologist,' April, 1921, pp. 94-97), remarks with reference to *Gryllus domesticus*, Linn.: "In dwelling-houses this cricket seems undoubtedly to be getting less common; in fact it is necessary to revise our estimate of its frequency." Possibly persistence in the disposal of household refuse by the primitive method of "dumping" may to some extent account for this phenomenon. At any rate a large refuse dump several acres in extent, close to the Great Northern Railway and not far from Hatfield, was found on April 12th, 1921, by Lieut.-Col. S. Monckton Copeman, F.R.S., and the writer, to be teeming with *G. domesticus*. Wherever the surface of the refuse was

disturbed a number of the insects in various stages, from quite young nymphs to adults, was almost invariably dislodged, while on merely walking over the dump the chirping of the males could be heard. The dump in question, which is the product of the dust-bins of a large London borough, is said originally to have been started thirty years ago. In view of the apparent partiality of the house-cricket for kitchen refuse, it is therefore not difficult to understand either the involuntary deportation to the country of large numbers of London crickets during this period, or the present size of the colony. It may be added that, in his 'Monograph of the British Orthoptera' (London: Ray Society, 1920), Mr. Lucas mentions three instances (one in England, two in Scotland) of the occurrence of *G. domesticus* in some numbers in or near refuse dumps.—E. E. AUSTEN; British Museum (Natural History), London, S.W. 7.

RECENT LITERATURE.

Annals of Tropical Medicine and Parasitology, vol. xiv, No. 2, November 27th, 1920, and vol. xiv, No. 3, February 8th, 1921.

A FEW papers touch on Entomology; they are:

(1) "Fish and Mosquito Larvæ in Bengal, Bihar and Orissa, India," by T. Southwell; pp. 181-186, 1920.

(2, 3) "Observations on the Ceratopogonine Midges of the Gold Coast with Descriptions of New Species," Parts i and ii; by H. F. Carter, A. Ingram and J. W. S. Macfie; pp. 187-274, with a number of text-figures and 5 plates, 1920.

(4) "Further Experiments with *Anopheles plumbeus*, Stephens; its Infection with *P. falciparum* in England; also Notes on the Apparatus and Technique Employed," by B. Blacklock and H. F. Carter; pp. 275-282, with 1 plate, 1920.

(5) "Observations on the Ceratopogonine Midges of the Gold Coast with Descriptions of New Species," Part iii, by H. F. Carter, A. Ingram, and J. W. S. Macfie; pp. 309-331, with a number of text-figures, 1921.

(6) "*Musca inferior*, Stein, Type of a New Genus of Philæmato-myine Flies (Diptera)," by Prof. M. Bezzi; pp. 333-340, 1921.

W. J. L.

OBITUARY.

WITH very great regret we have to record the death, on February 2nd, of Dr. Tsunekata Miyake, F.E.S., aged 42 years.

He was born on May 21st, 1880, at Kanazawa, Ishikawa Prefecture, Japan. From early youth he took a special interest in entomology. At the age of seven years he moved to Tokyo, where he collected and studied insects more eagerly and got up several entomological books.

After he had graduated at the Science College of the Tokyo Imperial University he wrote upon Lepidoptera and Neuroptera and described several new species, but he was widely and better known as an authority on Mecoptera of Japan.

In 1917 he took his Doctor of Science by presenting a thesis, viz. "Studies on the Mecoptera of Japan."

At the time of his lamented decease he was studying on the Japanese Trypaneidæ.

N. M.

EXCHANGE.

NOTICES OF EXCHANGE should be received by the 21st of each MONTH to insure insertion. Not more than SIX LINES can be allowed for each

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-
BURY, N W 2.

MEETINGS OF SOCIETIES.

CONTENTS.

New Forms of Sphingidae, *J. J. Joicey, F.R.S., F.L.S., etc., and G. Talbot, F.R.S.*, 105. Fossil Tipulidæ from the Oligocene of the Isle of Wight, *T. D. A. Cockrell and F. H. Harris (continued from p. 84)*, 109. The Macrolepidoptera of County Tyrone, *Thomas Greer (continued from p. 35)*, 113. Collecting in 1918 and 1919 in Gloucestershire, etc., *C. Granville Clutterbuck, F.R.S.*, 117. Notes on the Season of 1920 in West Sussex, *C. M. Woodford*, 119. Notes on Lepidoptera at Alton in 1920, *E. J. C. Stowell*, 122.

RECENT LITERATURE. *Annals of Tropical Medicine and Parasitology*, 128.

(OBITUARY, 128)

[illegible]

LOCALITY LABELS for Entomological Specimens.

Modern Type. Various Styles. Labour-saving Arrangement.

FRANK LITTLEWOOD (Dept. E), 22, HIGHGATE, KENDALL.

CABINETS. Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Which you lost?

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

JUNE, 1921.

[No. 697.

THE
ENTOMOLOGIST

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S. W. J. LUCAS, B.A., F.E.S.
H. ROWLAND-BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.
W. L. DISTANT, F.E.S., &c. Dr. D. SHARP, F.R.S., F.E.S., &c.
F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.
C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.
BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also

Birds' Eggs

(Singles as well as in Clutches)

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION
36, Strand, London, W.C. 2.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

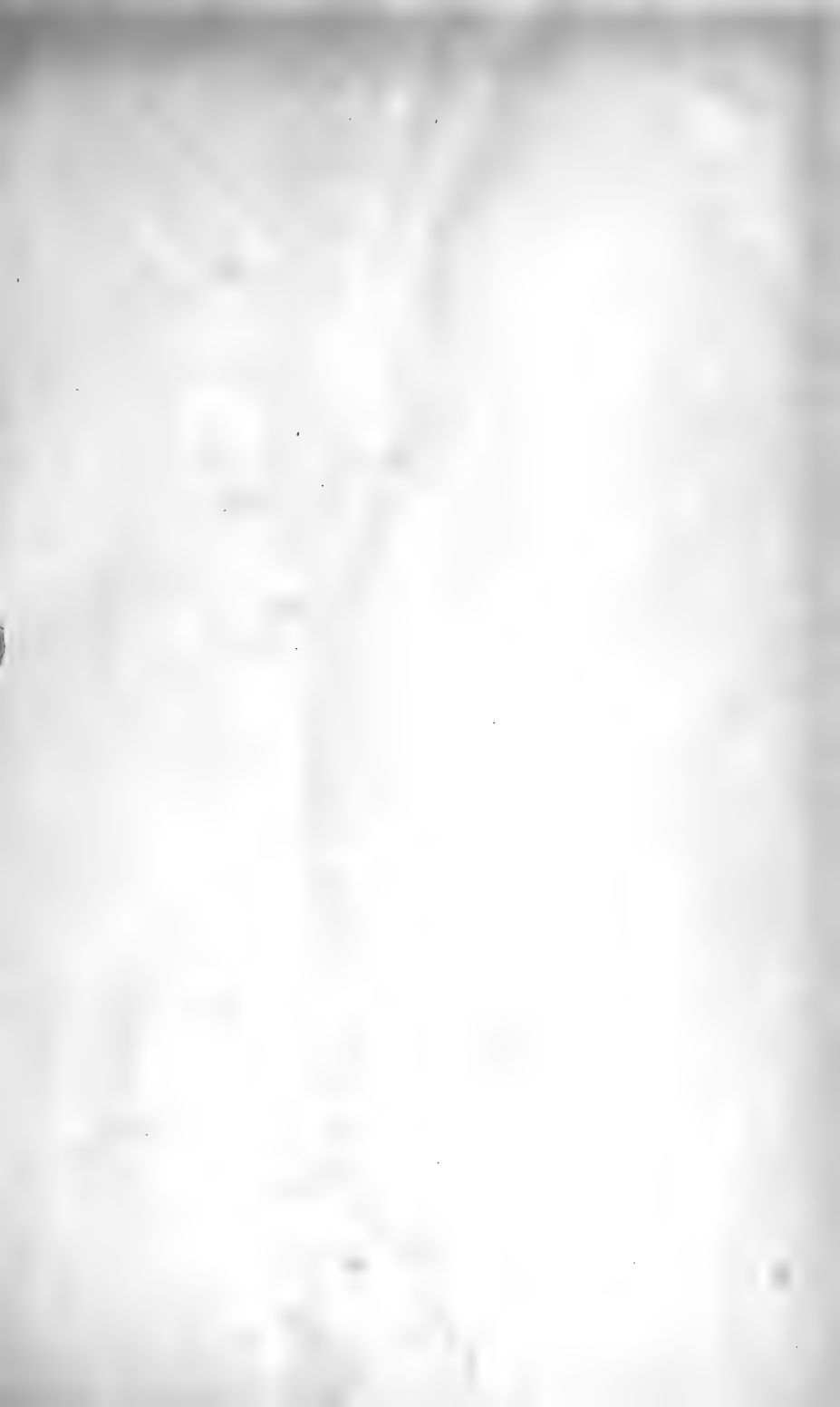
Most of the Single Parts from 1890 (Vol. 24) can be supplied separately at the following prices: 1890 to 1914, 1s. each; double numbers, 2s. each; 1915 and 1916, 9d. each; double numbers, 1s. 6d.; 1917 and 1918, 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910 Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s.

20,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 British Coleoptera, 2500 species, 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

GOOD ACCOMMODATION (and cooking) for Entomologists using Wicken Fen. Centrally situated. Two adjoining bedrooms and sitting room.

Mrs. GEORGE GORDON, WICKEN LODGE LANE,
NEAR SOHAM, CAMBRIDGESHIRE.





1



6



2



7



3



8



4



9



5



10

THE ENTOMOLOGIST.

VOL. LIV.]

JUNE, 1921.

[No. 697

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

It is a remarkable fact that although this species is one of the best known, and certainly the most beautiful of our British Tortrices, if indeed it is not the most beautiful Lepidopteron now to be found in the British Isles, its life-history is practically unknown; for though various Lepidopterists have bred odd specimens, so far as I am aware the larva has never been identified, and its habits and date of pairing and the egg stage are quite unknown.

This is all the more singular because the larva is, for a Tortrix, very distinct, and one which is easily recognisable—how easily the following incident will show:

Early last June, being at Brockenhurst, I called upon Mr. George Gulliver, and showed him a few larvæ I had reared from ova, and two or three which I had the same day beaten from oak in a wood near Brockenhurst. Mr. Gulliver, although he must have taken many hundreds of the imago, had never bred the species, or recognised its larva, but a few days afterwards he beat some larvæ which he recognised as those of *O. literana*, and later on in the summer actually bred out a number of specimens.

So far as I am aware the specimens that have been casually bred have always come out of oak. Barrett says ('Lep. Brit. Isles,' x, p. 217), "There can be little doubt that it (the larva) feeds on oak." The latest writer on the species, Kennel ('Pal. Tort.', p. 83), says: "The larva lives from May to August on oak (*Quercus robur* and *pedunculata*) between spun leaves; it occurs certainly also on maple and birch, probably in two generations, the first in May and the beginning of June, the moth in July and August, the second in July and August, and the moths from September on through the whole autumn and winter." This suggestion that it may have two broods is certainly not correct so far as Britain is concerned, though it may be in the warmer regions it inhabits.

Amongst others who have bred it is Mr. South, who in 'Entomologist,' xv, p. 58, reports "a number bred from larvæ beaten out of oaks" (in North Devon).

There are several references to its feeding upon birch which are probably correct, for, as will be seen, it will feed upon the

leaves of this and several other trees ; but the suggestion which has been made that it feeds upon lichens, probably through the cryptic resemblance of the imago to these plants, I cannot find any support for.

It has not proved an easy task to work out the life-history, because I have found it difficult to hibernate the moths, and when I have succeeded in doing so it has been difficult to obtain ova from them in the spring. In the past five years I tried fruitlessly until last year. I did manage to get two females through the winter of 1917, from which there resulted a very few ova, but these proved infertile.

In the autumn of 1919 about two dozen imagines of both sexes were put in a large glass and perforated zinc cage, in which were placed leafy branches of oak. On the 28th of the following March, the season being very forward, I thought it advisable to inspect the contents of the cage and found there were twenty-one moths still living. I then introduced some freshly-cut branches of oak into the cage and stood it in a sheltered and shady position. On April 8th most of the moths were dead, but two of them were living and seemed fairly strong and healthy. On taking the branches out of the cage and examining them I found they were sprinkled over with about four dozens of the ova ; these were deposited on the twigs, mostly singly, and on roughened places on the bark ; in some cases, however, two or three ova were placed adjoining each other and partly overlapping. They were very difficult to see : the parent moth is very apt to search out small depressions in the bark and to deposit an ovum in one of them ; in such situations the upper part of the ovum was usually level with the top of the depression. In one case an oak twig contained a number of shallow oval-shaped depressions ; some of these were taken advantage of by the moth, which deposited an ovum therein, almost entirely filling the depression, and the ovum was consequently nearly invisible.

THE OVUM.

The outline of the ovum is oval, with a length of about .83 mm. and a breadth of about .33 mm. The height is about .18 mm. It has, like all the Tortrices with which I am acquainted, its polar axis horizontal ; the surface is divided by very fine raised margins into a number of irregularly shaped cells. It is highly glabrous and opalescent when first deposited ; the envelope is not transparent ; as viewed by the naked eye the ovum appears to be pearly grey in colour. On April 11th the majority of the ova became leaden tinted, with an orange-coloured nucleus. The first ovum was noticed whilst the oak branches were in the cage on April 3rd. An ovum deposited on April 13th and kept under daily observation had changed to leaden colour five days after. It must be borne in mind that the season in April, 1920,

was at least three weeks in advance of the average. On the 11th of the month the oaks were breaking into leaf. The few ova I obtained in 1917 were not deposited until April 27th—a date I should consider about normal in an average season.

THE LARVA.

The first larva appeared on April 26th; this was from one of the earlier deposited ova, and therefore it would appear that this stage has a period of about three weeks.

A larva which emerged on May 2nd was kept under observation in all its stages, and the following notes were taken of it:

The length at first is about 1.4 mm. The head is intensely black and very glabrous; the rear portion consists of two prominent lobes, which have rounded bases. The head itself is somewhat acutely pointed in front; it is furnished on each side of the mouth with a prominent excrescence, which, owing to the smallness and activity of the larva, it is difficult to determine the structure of, but they appear to be tubercles emitting spines, and they are certainly retractile.* The prothorax is greenish white and very glabrous. The segments at the rear of the prothorax are greenish white and very spiny; the prolegs are large; they are greenish white in colour. The head is very large in proportion to the size of the body.

This larva was put in a small tin box with two oak leaves, one placed over the other; it mined in the first instar between the upper and lower cuticles of the upper leaf, entering from the lower side.

On May 14th the larva was in the second instar; it was now about 2 mm. long. The head and prothorax are intensely black and glabrous; the division between the two is wide and greenish-white in colour; the segments behind the prothorax are greenish-white and very transparent, the alimentary canal showing very distinctly. The prolegs are greenish-white, tipped and shaded with black; the larva is very spiny, the spiracles are not conspicuous. The retractile organs on each side of the mouth are not so prominent as in the last instar, but they are still distinctly visible. The larva in this instar does not mine the leaf, but feeds upon the lower cuticle, spinning a web alongside the midrib and dwelling therein.

On May 23rd the larva was in the third instar. It was now 5.75 mm. long, light greyish-green in colour, very transparent, with the contents of the alimentary canal very distinct; head and prothorax intensely black and glabrous, the division between the two similar to the preceding instar. There is no trace of an anal plate. The larva is very spiny; the prolegs and feet

* Since writing the above I am informed by Dr. Chapman that these protuberances are probably the antennae. This question requires further elucidation when the material is available.

are intensely black and glabrous; the retractile organs on each side of the mouth are still visible. The larva in this instar spun the lower leaf to the bottom of the tin in which it was kept, and fed upon the lower cuticle.

On May 31st the larva entered the fourth and last instar; it was then 9 mm. long. The head is dark brown, mottled with black; it is very glabrous; the segments behind the prothorax are light greyish-green, the intestinal canal showing plainly as a dark line; the prothorax is of the same green tint, but it is more glabrous. On each side of this segment in the sub-dorsal area is a prominent dark brown blotch; these are placed about 1 mm. apart. The thoracic legs and feet are black and shining; the spiracles and tubercles are very inconspicuous. In all the instars the larva is very spiny; it tapers a good deal towards the anal extremity, and is exceedingly active, wriggling violently when disturbed. In this stage it spins together two leaves of its food-plant and skeletonises them in a similar manner to *Rhodophea consociella*, but does not make any web like that species.

On June 10th the larva was full grown and ceased feeding; it was 18 mm. long; there was no perceptible difference since it was last described, except that of course the head was much smaller in proportion to the size of the other segments.

The larva in confinement would eat birch, lime, apple, beech, and of course oak, but refused plum, elm, hazel and horn-beam. Being mindful of its supposed pabulum of lichens I offered it several species, which it refused to touch, but immediately an oak-leaf was put in the cage it began ravenously to devour it; this experiment would seem to dispose of the supposed liking for lichens.

On June 14th the larva spun up for pupation between two oak leaves.

THE PUPA.

The pupa, one week after the change, was light reddish-brown in colour, darker at the junction of the segments. The wing-cases were lighter; the surface is only slightly glabrous. The abdominal segments are reticulated on the surface. The head has a distinct proboscis or cocoon opener, which, however, is blunt at its extremity. The wing-cases extend to the rear of the fifth abdominal segment. Each abdominal segment has the usual row of spikelets. The pupa has very few spines; it terminates in the usual anal hook, which points ventrally; it tapers gradually from the sixth abdominal segment to the anal extremity, which is blunt and square. The pupa is 8.50 mm. long.

The imagines, eight in number, emerged during the last week in July.

The larva is easily distinguished during the last instar from

any other that is feeding upon oak at the same period by the prothoracic markings, the greyish-green colour, and the gradual tapering to the anal extremity. In an average season it is probably full grown towards the end of June after the great crowd of larvæ, such as *Tortrix rirdana*, *T. xylosteana*, etc., have pupated; there are very few larvæ feeding then.

I did not find it common in the New Forest in a locality where the imago is usually frequent, but I got four larvæ as the result of about two hours' beating.

O. literana has been found abroad in Central Europe, Italy, Sardinia, Scandinavia, Russia, Northern Asia and Asia Minor; probably it occurs over practically the whole of the Palearctic area.

In Britain its chief habitat is in the New Forest, where in some seasons it is locally common; in one or two woods there, known to me, it is to be obtained every year in some numbers. According to Barrett it is also found in many other woods in the south of England and in Wales; it appears, however, to be non-existent in some of the midland counties, is rare in the north of England, it is found in Scotland occasionally in the Edinburgh district, Perthshire, Roxburghshire, and the Clyde Valley, but in Ireland is confined to the counties of Cork and Kerry.

I have usually obtained it by beating low overhanging branches of oak trees in the morning; it then usually flutters down slowly to the ground and one can intercept it with the net. In the afternoon, however, it is more lively and generally darts at once to the ground, where its colour makes it hard to see, or it flies swiftly away, in either case escaping capture in too many instances. Of course if the weather is cold it is better to wait until the afternoon makes it a little lively. It is fully out by the middle of August, and the best time to obtain it is from then until the end of September, after which it often goes into hibernation; the hibernated moths are rarely seen in the spring.

Barrett says: "The moth sits by day on the trunks of trees; in the summer and autumn it loves to squeeze itself closely to the surface of an oak or apple-trunk among the lichens, when it is so closely concealed by its resemblance to them that it can only be discovered by blowing strongly with the breath upon the trunk." I have vigorously thrashed hundreds of oak trunks when working for this species, but have never been conscious that I have put up a specimen from one (though I have seen it occasionally rest upon them after being disturbed). So far as my experience goes the usual resort of the species is the overhanging branches, and if one is put up it will almost invariably settle again on a branch. Bearing in mind that even in the New Forest a dozen specimens in a morning is a more than average bag, it must take a power of breath to shift a series from the trunks by blowing!

VARIATION AND VARIETAL FORMS.

O. literana has an extensive range of variation : so extensive, in fact, and so distinct and widely apart are certain of the forms that the earlier authors considered there were several species involved.

A number of the forms have been figured, in some cases exceedingly well : unquestionably the best group of figures is Hübner's 'Tortrices,' figs. 88 to 97. The various forms keep very distinct, and there is little tendency for intermediates to occur, although these turn up from time to time.

O. literana, L. (Plate I, figs. 1 and 2.)

Synonymy.—*Literana*, L., Syst. Nat., edn. x, p. 530, No. 204 (1758); Edn. xii, p. 876 (1767); Schiff, S. V., p. 317 (1775); Fab., Sys. Ent., p. 646 (1775); Fab., Syst. Ent., tome iii, part ii, p. 271, No. 122 (1794); Hüb., Tort., fig. 89 (1797); Donovan, Brit. Ins., x, pl. 355, fig. 2, and p. 78 (1801); Haworth, Lep. Brit., p. 411, No. 53 (1803); Hüb., Verz., p. 386, No. 3747 (1826); Fröl., Tort. Wurt., p. 18 (1828); Stephens, Cat., p. 187, No. 7094 (1829); Curtis, List, p. 173 (1829); Treitsche, Schmett v. Eur., viii, p. 184 (1830); Rennie, Conspectus, p. 179 (1832); Curtis, Brit. Ent., p. 440, No. 1 (1833); Stephens, Haust., iv, p. 164 (1834); Godart et Duponchel, Hist. Nat., ix, p. 126, and pl. 242, figs. 1a and 1b (1834); Wood, Ind. Ent., fig. 1098 (1839); Westwood, Brit. Moths, pl. 96, fig. 10, and p. 164 (1845); Herr. Schöff., Schmett. v. Eur., iv, p. 152 (1849); Wilkinson, Brit. Tort., p. 160 (1859); Stainton, Man., ii, p. 230 (1859); Staudinger, Cat. Lep. Eur., p. 94 (1861), and p. 233 (1871); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176 (1882); Sorhagen, Klein. Schmett. Bran., p. 65 (1886); Meyrick, Brit. Lep., p. 522 (1895); Staudinger, Cat. Pal. Lep., ii, p. 81, No. 1458 (1901); Barrett, Brit. Lep., x, p. 216, and pl. 455, fig. 3 (1905); Spuler, Schmett. Eur., taf. 83, fig. 11, and p. 242 (1908); Kennel, Pal. Tort., taf. 5, fig. 1, and p. 82 (1908); Wagner, Lep. Cat., par. x, p. 68 (1912).

Original description.—*Phalaena tortrix literana* alis rhombeis superioribus viridibus characteribus atris. Habitat in Germania. Simillima præcedenti (*viridana*) sed alis saturatius viridibus. Characteribus plurimis atris (Linnaeus, 'Syst. Nat.,' ed. x, p. 530, No. 204 (1758)).

The type form occurs generally wherever the species is found in Britain;* although not *the* most abundant, it is one of the

* There is considerable variation in British examples of the type form; the majority have the black linear characters heavily marked as in Fig. 1. Others have these characters very slightly indicated as in Fig. 2, and there are all degrees of intermediates between those two. The description of Linné applies equally to all those forms, and unfortunately we are without evidence as to what his specimen was like other than his very brief description. It is not in his collection at Burlington House, and Clerck does not figure it. It is not improbable that he never saw the type, but that he described it from a German or other correspondent's description.

commonest forms. I should consider that in the New Forest it represents 20 to 25 per cent. of the specimens captured.

EXPLANATION OF PLATE I.

FIGS.

1. *Literana*, L., strongly marked form.
2. " " lightly " "
3. ab. *romanana*, Fab.
4. ab. *fulvoliterana*, n. ab.
5. ab. *tricolorana*, Haw.

FIGS.

6. ab. *nigro-maculana*, n. ab.
7. ab. *mixtana*, n. ab.
8. ab. *irrorana*, Hüb.
9. ab. *squamulana*, Hüb.
10. ab. *suffusana*, n. ab.

(To be continued.)

COLIAS EDUSA, FAB. (*CROCEUS*, FOURC.):
ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

In common with so many of our native or immigrant species, *Colias edusa*, the Clouded Yellow, is entangled in the distracting meshes of multiple nomenclature. I do not propose to discuss the merits of "*Edusa*," except to remark that Fourcroy's (Geoffroy's) '*Entomologia Parisiensis*,' where the butterfly appears as *Croceus*, was published in 1785, whereas the volume (tom. ii) of Fabricius' '*Mantissa Insectorum*' is dated 1787. Whether the insect described by Linnæus ('*Syst. Nat.*,' ed. x, 1, p. 469, 1758) is or is not our *Edusa*—he calls it *Hyale*—is a moot point, but both Esper and Kirby* were satisfied, and labelled the species accordingly, and, as a reviewer of the famous '*Catalog*' of 1901 points out,† Staudinger deliberately violated the law of priority when he maintained *Edusa*.

In my "*Working List*" ('*Entomologist*,' li, p. 1) and for the purposes of this paper, and in view of the nomenclature still followed by British lepidopterists, and pending an authoritative decision by the International Committee on Nomenclature, I reluctantly retain the time-honoured "*Edusa*," though the majority of continental lepidopterists have now reverted to the older "*Croceus*," and I find that M. Oberthür, too, adopts *Croceus* in his account of the species in Algeria ('*Lépid. Comparée*,' fasc. x, p. 75).

My present object is to set forth its seasonal forms, named varieties and aberrations, especially as many of our collectors, judging from their contributions to this magazine, are not altogether familiar with the published descriptions even of such as occur periodically in the United Kingdom.

SEASONAL FORMS.

All evidence available goes to prove that *Colias edusa* lives and often flies continuously throughout the year in the warmer

* '*Cat. Diurn. Lepid.*,' Supplement, p. 799, No. 2, 1877.

† '*Entomologist's Record*,' vol. xiii, p. 323, 1901.

regions of the Mediterranean littoral. From the eastern area (Palestine) I have female examples, kindly sent me by Capt. Barraud, late R.A.M.C., taken at Beisan, 400 ft. below sea-level, on January 31st, 1920, already worn. They are small (= *ab. vel forma minor*, Failla), dusky, and the orange-yellow ground-colour lacking in lustre. They are the parents of the next emergence, which apparently takes place at or towards the end of March. Fresh female examples on the 31st, north of Jerusalem, 800 ft. below sea-level; and again fresh females at Haifa, on the coast, May 21st, 1920—these last two rather larger, but still small compared with the *gen. aest.* (= first emergence in England) form of August. From that date onwards there would seem to be no month when *Edusa* was not observed in the plains.

Passing to Cyprus, we find the Cypriot race described* as a little above the average size, and very common from March to November. I may say *en passant* that I have never seen an example of *helice* or *pallida* of the first spring brood, but unless it is a warm seasonal form, I see no other reason why it should not occur. Dr. Verity has figured ('Rhopal. Palæarct.', pl. xlvii, fig. 11) a ♀ *vernalis-aubuissoni* which is decidedly a transition form to *Helice*. In Lower and Middle Egypt, Major P. P. Graves says ('Bull. Soc. Ent. d'Egypte,' 1915, p. 150) that while *Edusa* may be taken any month throughout the cultivated areas, it is most numerous in winter, as one might expect, the imagines from well-matured larvæ feeding on "bersim," a species of clover. But though he does not date the *Pallida* observed, "sometimes exceptionally large," it is most likely they fly at the time when the vegetation is luxuriant, viz. in (our) winter months.

In North Africa the Rev. E. A. Eaton ('Ent. Mo. Mag.', xix, p. 43) records a female on the wing at Algiers apparently ovipositing, and it was encountered there, and inland to Biskra in February by Miss Fountaine when collecting in these regions; M. Oberthür's collection includes January examples from the same localities; Lord Rothschild reports others at 3300–3600 ft. on the Hauts Plateaux in April and May ('Nov. Zool.', xxi, p. 307, 1914). The Algerian males vary from rather pale yellow to bright orange yellow, and, with the females, often constitute intermediates to *Helicina*, Obthr.

In a very useful paper† published in 1919 in the 'Entomological Record,' Dr. Verity discusses the seasonal appearances of *Edusa*, and it is clear from his remarks that, given favourable weather conditions, the butterfly emerges continuously throughout the year in and up to Central Italy (Tuscany), and with this peculiarity that, whereas the second main emergence is of typical

* "The Butterflies of Cyprus," H. J. Turner, 'Trans. Ent. Soc. Lond.', 1920, p. 184.

† "The Varieties, Various Modes of Emergence, and the Number of Broods of the Grypocera and of the Rhopalocera of Southern Europe, illustrated by Tuscan Specimens," p. 87, and correction, p. 121.

form, the third is only partly so. From mid-October onwards, and after the tardiest females of the third generation have put in an appearance, males emerge with all the characters of the *gen. vern.*, followed in due course, and when days are mild, by corresponding females. Here then the *gen. vern.* lasts from October to May. In June comes a new and typical generation, followed in August and to mid-October only by another typical brood.

Working northward from Tuscany, Dr. Ubaldo Rocci devotes a long paper in his interesting and instructive "Osservazioni sui Lepidotteri di Liguria"* to the phenology and racial characters of *Colias edusa* in Liguria, and gives a formal name—*autumnalis*—to the autumnal form, noting that the three forms as they occur in the region of Genoa are distinguishable, though the first autumn emergence is differentiated only in minor degree, as compared with the vernal, from the *gen. æst.*

With regard to the vernal form, I need say no more than that he agrees with Dr. Verity's diagnosis, adding that, whereas in some seasons *vernalis* is common, and the characters of the form strongly accentuated, in others it is rare, and the distinguishing characters little in evidence. He considers that the summer (typical) form has two generations—one from May to about the middle of August, the other from the end of August into September—and the Ligurian examples are larger than those of Piedmont.

It becomes increasingly interesting, therefore, to trace and determine the northern limits of the form *vernalis*, and further to ascertain the continuity of the form within such limits. The earlier French collectors and authors do not appear to have recorded the first flights of *Edusa* on the littoral, probably because their knowledge was confined to the second (*gen. æst.*) emergences. De Graslin, it is true, states (1862) that a form closely resembling *Chrysotheme*, Esp., occurs at Collioure, Pyr. Or., and this should correspond with the normal form *vernalis*. M. Rondou, whose own observations are rather of the Central Pyrenees, also makes no mention of a spring race, nor does he cite var. *Pyrenaica*, Gr. Gr., which seems likely to be the ab. *minor* of Verity, and of the same early spring form. But though the records are indefinite—Mabille in his 'Aperçu des Lépidos . . . de l'Aude' (1885) specifies no date of emergence for *Edusa*—it may be assumed from the known meteorological conditions prevailing in the western Mediterranean that the species maintains itself along the Spanish seaboard, and along most of the coast from the Pyrenees to the Alpes-Maritimes, in a succession of broods throughout the year at sea-level and in the plains as upon the French Riviera, with the possible exception of that part of the Bouches-du-Rhône where the conditions are less favourable. At

* 'Atti Soc. Ligustica di Sci. Nat. e Geog.' Anno xxx, N. 4, 1920.

all events, M. Foulquier ('Cat. des Lépid. des Bouches-du-Rhône,' 1899) contents himself with the observation "March to October." I should be inclined to think—and my personal observations of the species support my view—that the continuous, or even occasional, appearances in winter of the imagines extends no further than the littoral, and is only possible in very favoured localities north of the line which divides the Midi from the central regions. Nothing like a systematic search of the in-coast Departments has yet been carried out by French lepidopterists. Millière hardly touched even the eastern fringe of Ardèche; Gard is *terra incognita* except the famous Pont-du-Gard locality; and the same may be said of Hérault, which since the days of Rambur, and a solitary visit long ago of the Entomological Society of France in early summer to Montpellier, has been left severely alone, and most undeservedly, so far as published observations are concerned.

On the French Alpes-Maritimes Millière does not help us. His allusions to *Edusa* are hopelessly incomplete; nor is Bromilow ('Butterflies of the Riviera') much more explicit with May and June for the first flight, meaning, I presume, the progeny of the real *gen. vern.*, for I have taken the small form at Hyères in March, and it has been reported there in January and February (February 12th, 1892, 'Entomologist,' xxvi, p. 128) by Bromilow himself. The Hyères first (fresh) emergence is undersized, rather pale in colour, but not conspicuously dusky in the females as in those from the eastern Mediterranean. Guillemot* supports my view that *Helice* does not appear with the true *gen. vern.* of Southern Europe.

M. Oberthür, moreover, considers that in France *Edusa* is a stable species only as far north as the Loire valley (Central France)—that is to say, that it has its regular succession of broods to that latitude, but that beyond it, including, of course, Great Britain, it is represented by the progeny of migrants, whether or not a few in specially favoured localities survive the northern winter of abnormally mild years in the larval state. Mr. R. Adkin has discussed† the whole question of British immigration, and the probable lines of communication adopted, but in harmony with M. Oberthür's ascertained facts, a part of our incomers might have their origin on the French Mediterranean coast-to-central area, and not entirely in the more distant (but certainly not impossible) North African preserves of the species. Emigration there may be from North Africa, but it is not easy to understand why, in ordinary years, the flight in search of feeding-grounds for the future offspring, if that be the motive of migration, should reach even these boreal climes when the

* 'Observations sur Les Lépidoptères du Printemps,' etc., 1856 (?).

† "Colias edusa in Britain," 'Proc. S. London Ent. and Nat. Hist. Soc.,' 1914-15.

lucerne fields and clovers of all France are at disposition. At present we have no reliable evidence that the *Edusa* on the wing in the Rivieran winter months is a wanderer. The evidence of its stability as a continuous-brooded species hereabouts is all the other way. Further, there is, I believe, no authority for the hibernation, *sensu stricto*, of the imago in this or any other locality.* The emergence of the autumn generation, September, October, November, may be finished at the end of the latter month, and oviposition is not likely to take place later; but the imagines may continue on the wing (both sexes) in December and January, and until worn out in the ordinary course of Nature. Commander J. J. Walker ('Ent. Mo. Mag.,' xxiv, p. 176) observes that at Gibraltar there is scarcely a sunny day in any month on which *Colias edusa* may not be met with in sheltered places, and Tutt,* rightly, I think, draws the conclusion that during the winter the larvæ of the Mediterranean first brood are feeding simultaneously, with only a very short pupal period.

On the other hand, judging from the appearance and size of the immigrants arriving in England in May, when the second French Riviera generation is as yet not fully developed, it is, in my opinion, open to doubt whether after all our *Edusa* are partly the offspring of these parents, as also presumed by Tutt (*op. cit.*, ix, 280), but are typical *Edusa* derived from and impregnated in remoter and warmer regions where the mean temperature of the winter is higher, for though by no means unusual, male *Edusa advena* are rare in the United Kingdom. Tutt collected carefully all the evidence to date (1899) in the matter of *Colias* migration, and the reader may be referred in relation to this habit of the genus to his papers on "The Migration and Dispersal of Insects Lepidoptera," published in the 'Entomologist's Record' in 1900 (vol. xii, pp. 70-72). He does not touch on the sex question, and the records of the great *Edusa* year (1877) in the 'Entomologist,' vol. x, pp. 187-190, 209-10, etc., are not very helpful, as observers in most instances are equally reticent. We have authority, however ('Entomologist,' *loc. cit.*, p. 210), for captures *in cop.* in such widely separated localities as Hants and Berwickshire in June; but Carrington's conclusion is that these were the results of successful intra-insular hibernation of the pupa, since apparently at this date it was not known to British entomologists that *Edusa* passes the winter proper in the larval state, and though capable of enduring slight frost (which *Hyale* is not), is incapable of sustaining life through a normal English winter. Be this as it may, I think the significant abundance of the species in the early part of the year in Cornwall at Land's End, and the records referred to, point to migration of both sexes, aided or not by the progeny of the previous year's migrants. In 1878 *Edusa* was reported on April 18th between Reading and

* "How *Colias edusa* Winters," 'Entomologist's Record,' vii, pp. 250-253.

Oxford, and at Ryde, I.W., on April 22nd (*op. cit.*, xiii, p. 116), but generally speaking it was conspicuous only by its absence in that year. A typical spring generation in the strict sense is, therefore, unrecorded and unlikely to occur in Britain of the form I have mentioned from the Mediterranean region, which has been named Stauder.

(i) *Gen. vern. vernalis*, Verity (1906) = *Mediterranea*, Stauder (1913). Costa bright rose-coloured and more brilliant than in the *gen. æst.* Ground-colour paler, marginal bands sometimes much enlarged; on the contrary, sometimes narrow, and the nervures therein as in *Chrysothème*, sp. Hind wings ♂ and ♀ very green; underside powdered bright green. Fringes light violet-rose; the series of anterior marginal spots strongly accentuated from costal to anal margin; hind wings with violet tint.

(ii) *Gen. æst.* The southern second generation and parents of our August emergence. Typical *Edusa*.

(iii) *Gen. autumn.* (= *forma autumnalis*, Rocci). Confined normally to the southern regions, and more or less typical, though often reduced in size. Parents of the *gen. vern.*, with late emergences probably continued to the advent of this form.

[? (iv) Viz. the late autumn form, which is that, or approximate to that, of *vernalis*.]

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

By F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 93.)

TRIFINÆ.

Eremobia ochroleuca.—Series of 40, 26 of which have data. Twenty-five are from Kent and Essex. One from the Champion Collection is labelled "bred Guildford."

Trachea atriplicis.—Twenty-seven, most of them from the older collections and without data. Two from the Norgate Collection, presented by Mr. B. H. Crabtree, and three from the Meldola Collection are labelled "Cambridge."

Valeria oleagina.—A single specimen, slightly damaged, from the Hope Collection. This is probably the specimen taken July, 1800, by Mr. Donovan near Fishguard, in Pembrokeshire. See 'Barrett,' vol. iv, p. 330.

Luperina testacea.—From the Meldola Collection. Is a very dark brown specimen, almost black, in which usually markings are almost invisible. It is labelled "Lancs, St. Anne's-on-Sea, bred 17.8.12."

L. guenéei.—Over 40 with full data from St. Anne's-on-Sea.

L. dumerili.—A specimen from the Spilsbury Collection without data.

Hama abjecta.—Thirteen with full data from Hants, Kent and Essex.

H. furva.—Nineteen with data. A series of 7 from the Meldola Collection labelled "Surrey, Banstead, 7.04." The rest from Scotland.

Apamea pabulatricula (connexa).—Twenty-four, 4 with data. Three from the Sellon Collection labelled "Sheffield, 1890"; 1 from the Meldola, "Barnsley, 1890, Maddison."

A. ophiogrammea.—Nineteen with data from Surrey, Cambs, and Middlesex.

Aporophyla lutulenta.—Thirty-three with data. Two var. *luneburgensis* from Scotland. Two var. *sedii* without data from the Spilsbury Collection.

Polia xanthomista.—Twenty-four with data. Of these 2 are from N. Devon, taken by Dr. Dixey—one September 15th, 1890, recorded in the 'E. M. M.,' 1893, p. 87; the other September 28th, 1898. Of the rest 8 are from N. Cornwall; 14 from the Isle of Man; 6 presented by Mr. E. D. Bostock; 2 from the Meldola Collection; 6 from the Robertson Collection (bt. Stevens).

Trigonophora flammea.—Twenty-three, 10 of them with data. One from the Hope Collection is labelled "Bramber Castle." One from the Meldola Collection, "Sussex, Balcombe Wood, Oct. 24, 1871"; others from the same collection, "Sussex, Lewes." Four from the Champion Collection, "Sussex, 1872."

Hydræcia lucens.—Twenty-three with data from Lancs, the Lake District and N. Staffs.

H. paludis.—Fourteen, all from the Meldola Collection; 8 labelled "Sussex, Bognor"; 4, "Kent, Deal"; 2, "Lancs, St. Anne's."

H. crinanensis.—Eight specimens. Two from the Meldola Collection labelled "Inveran, fr. L. W. Newman." Six from "Near Thursby, Carlisle, Aug., 1920, examined and certified by the Revd. C. R. N. Burrows." Presented by the Rev. H. D. and Mr. E. B. Ford.

Nonagria cannae.—Twelve with full data, all from Norfolk.

N. sparganii.—Sixteen with full data. Three of them are from the Meldola Collection, one of them being the specimen taken in Deal in 1884, mentioned in 'Barrett,' vol. v, p. 83, and recorded in 'Entom.,' 1884, p. 253; and in 'E. M. M.,' 1884, p. 135.

Senta maritima.—Twenty-seven with data. Six from Whittlesea, presented by Mr. J. Peed. Eighteen from the Robertson Collection (bt. Stevens), which include 2 var. *bipunctata* and 2 var. *wismariensis*.

Tapinostola extrema.—Twelve with full data from Northants and Huntingdon.

Synia musculosa.—Two from the Spilsbury Collection without data.

Leucania favicolor.—Three specimens. One from Sheppey, presented by Commander J. J. Walker. Two from the Meldola Collection, labelled "N. Kent, 1911."

L. obsoleta.—Five with data. Three from the Meldola Collection, labelled "Ely." One from Whittlesea, presented by Mr. J. Peed. One from the Champion Collection, labelled "Ely."

L. brevilinea.—Twelve with data. Three v. *sinelinea*, Farn.

L. putrescens.—Twenty-one with data, all from Torquay.

L. unipuncta (extranea).—Two specimens. One from the Meldola Collection, labelled "Walmer, 1 . 9 . 78," recorded in 'E. M. M.,' 1878, p. 107, and mentioned in 'Barrett,' vol. v, p. 163. One taken by the Rev. G. Hughes in the New Forest, 8 . 10 . 96, recorded in 'Entom.,' 1896, p. 333.

L. vitellina.—Four with full data. Three from the Meldola Collection, taken in Sussex, and one from S. Devon.

L. albipuncta.—Eight with full data. Six from the Meldola Collection; 4 taken in Sussex, 2 in Kent, and 2 from S. Devon, taken by the Rev. G. Hughes.

L. turca.—A long series from the New Forest.

Caradrina exigua.—Seventeen with full data, most of them from S. Devon.

Acosmetia caliginosa.—Seventeen specimens, but only 4 with data, from the Meldola Collection, labelled "New Forest, 1877-78."

Pachnobia leucographa.—Twenty-one specimens, 6 with data, from Wales, Surrey and Yorks.

Teniocampa gothica.—A long and very varied series, with full data, including several v. *gothicina* and intermediate forms.

T. incerta.—A long and interesting series. A very remarkable aberration from the Spilsbury Collection, without data.

T. opima.—Sixteen with full date. Five from Wyre Forest taken by myself. Four labelled "Lewes" from the Sellon Collection. Seven from the Meldola Collection, labelled "Lancs, St. Anne's-on-Sea."

T. gracilis.—A long series, including 40 specimens of var. *rufescens*, Cockerell, from the New Forest, bred by myself. These show a very great amount of variation in colour, from light greyish pink to very dark brown.

Dicycla oo.—Fifteen specimens with full data, including 5 var. *renago*, Haw.

Calymnia pyralina.—Thirty-seven with full data from S. Wales, Surrey and Middlesex.

Cosmia paleacea.—Five specimens with data. Four from the

Champion Collection, labelled "Sherwood Forest, 1872." One from the Meldola Collection, labelled "Ross-shire, Fortrose, 1903, found in a spider's web."

Plastenis retusa.—Sixteen specimens with data from various localities.

P. subtusa.—Twenty-one specimens with data.

Cirrhædia xerampelina.—Four specimens with data. One from Cornwall, one from Oxford, one from Cambridge, and one labelled "Wales, 1888."

Ochria aurago.—A series of 40 with full data, showing much colour variation.

Mellinia ocellaris.—Five specimens with data. One from the Meldola Collection, labelled "Twickenham, Sept., 1893. 'Barrett,' vol. v, p. 397." The other 4 are also from the Thames Valley.

Orrhodia erythrocephala.—Three specimens, of which two are from the Spilsbury Collection with no data. The third from the Carden Collection (bt. Stevens, 1919), is labelled "Kemp-Welch Collection."

O. rubiginea.—Fifty specimens with full data, nearly all bred specimens, from various collections. One from the Meldola Collection is of an almost uniform brown without the usual irroration.

(To be continued.)

NOTES ON LEPIDOPTERA AT ALTON IN 1920.

By E. A. C. STOWELL.

(Continued from p. 123.)

HETEROCERA.

Once again the oak trees in Alice Holt were absolutely denuded by *Tortrix viridana*. This is, I am told, the third time in four years, and one wonders how the other spring oak-feeders survive. They certainly were scarce this year, though I took one *Boarmia roboraria*. It occurs to me that this may explain the cannibal propensities of *Cosmia trapezina* and *Eupsilia satellitia*, both oak-feeders by preference. Failing leaves they must needs eat the larvæ that have eaten the leaves. I find confirmation of this view in the fact that the closely allied elm-feeding *Cosmiæ* show no such inclination—at any rate, I reared a number of *C. affinis* this year in a small jar without any ill effects. The willow blossom yielded only common things, especially *Teniocampa pulverulenta*, which outnumbered everything else by twenty to one: however, I got a nice set of *T. munda*. Sugar in June at the foot of the Downs produced *Xylophasia sublustris* and common things, but in the Holt not an insect came, and in the autumn both sugar and ivy blossom were utterly devoid of insects, nor were there any larvæ to be beaten. Some moths came to light at midsummer, the best being perhaps *Neuria reticulata*, which came

on three evenings. In the autumn nothing came on the most favourable nights but a few *C. lychnidis* and *H. micacea*. It was in fact a wretched season for imagines, though I discovered *Epione advenaria* at Selborne, and, in a swamp by the river here, *Leucania straminea*, *Acidalia immutaria* and abundant *Nudaria senex*. The most profitable work was larvæ-beating in the early summer. The oaks were hopeless as one only filled the umbrella with the exuvæ of *T. viridana*, so I attacked the chalk flora, and clematis, buckthorn and maple yielded everything I expected. Most noteworthy were *Eupithecia inturbata*, May 14th on maple trees. *Ptilophora plumigera*, four on May 31st. Three of these emerged within twelve hours November 8-9th, a remarkable piece of timing! They do not appear to have a fixed time of day for emergence. One was drying its wings at 11 p.m., another was out by 8 a.m., and a third in the course of the morning; the fourth also emerged in the morning, a few days later. This species may be commoner than is supposed. The larva is a common looking thing, with none of the characteristics of a Notodontid larva, and they were full fed by the end of May. I also beat four larvæ of *Lophopteryx cuculla*, three very small on July 5th, and one larger later on. One small one produced a host of Chalcid flies, two were presumably injured in beating and went mouldy, and only one pupated. These larvæ when very small are distinctly bristly, a fact which I do not find mentioned in the books. They are, however, unmistakable when closely examined.

Emergences must have been protracted this season and I had an interesting illustration. I found a ♀ *Dicranura vinula* on a poplar trunk on May 9th. On July 27th a boy brought me an infant larva which I assumed to be *Cerura bifida* from the date, until it began to attain such portentous dimensions that at last it dawned upon me that it was *D. vinula* after all. One other experience had its humorous side. I found a winter nest of *Euproctis chrysorrhæa* on the cliff at Ventnor on April 19th and took it home. Though no bigger than my fist the number of young larvæ that emerged from it was positively alarming. They are not pleasant to handle and were a real *embarras de richesse*. I did not like to turn either larvæ or imagines loose, for if they took possession of the neighbouring orchards I should find myself unpopular next year. So after setting what I required, I let the rest live their life out in the cage. Strange to say, none paired, or at any rate deposited any ova.

On looking back over my notes I see that I took *Eupithecia pumilata* flying on April 3rd, a very early date. Also on May 15th in a spruce wood at Tisted I found *E. pusillata* common, and what I take to be the true spruce-feeding *Thera variata*.

Eggars Grammar School,
Alton, Hants.

NOTES AND OBSERVATIONS.

DUSKY MALE FORM OF DRYAS PAPHIA.—I have lately compared the males of *Dryas paphia* taken last year in the Bucks. Chiltern Hills with examples in my collection from numerous localities at home and abroad. Those from the New Forest and Monkswood, and from the Chilterns in former years, are all of the usual foxy or fiery red-brown to light bright brown colour, and the same may be said of the continentals extending in observation, east to west, from the South Carpathians to the South-west Pyrenees. The duskiness is chiefly in the basal area of the fore and hind wings, and due to the darkening of the hairs therein. *D. paphia* is not common, as a rule, at the particular spot chosen for observation, but in August, 1920, it was wide-spread and frequent together with *Argynnis cydippe* (for many years also scarce hereabouts and in one or two wanting, or, at least, so rare as to have been overlooked), the dusky form being predominant and in some places the only form on the wing. Male variation of this species, other than by failure of pigment, is rare in my experience; but it is noteworthy that in nearly all examples of Argynnids and Brenthids from Central France, Auvergne and the Cevennes, I detect an inclination towards a clear clay ground-colour—that is to say, in a direction precisely the opposite of the Chiltern *paphia*. On the other hand, as far as I can see, the Chiltern females were normal. Otherwise I might have been led to conclude that the duskiness of the males is attributable in some way to the damp and unsettled weather which prevailed during their pre-imaginal stages, though, of course, the dark form *valesina* occurs with the typical light females in the New Forest and elsewhere, whatever may be the meteorological conditions during development. I have never heard of *valesina* in Buckinghamshire. If any collectors have met with it in the county will they kindly notify the fact without mentioning the exact locality of capture.—H. ROWLAND-BROWN; Harrow Weald, May 1st, 1921.

ON THE APPEARANCE OF ANOSIA PLEXIPPUS IN BRITAIN.—Hitherto it has always been considered that the occurrence in the British Isles of *Anosia plexippus* has so far as known been due to voluntary immigration. But, as I have previously stated ('The Field,' April 17th, 1915), it is probable the specimens which have been seen and captured in this country have received assisted passages across the Atlantic on board ships. But at that time no proof existed as no observations of the kind had been recorded. It is therefore with considerable interest that I am now able to place on record the following facts regarding the appearance of this American species in England under certain conditions, but whether such applies to all the thirty specimens observed and captured in the British Isles and others elsewhere in Europe cannot be ascertained. For the following very interesting facts I am indebted to Mr. Geo. B. Pearson, who writes to me as follows: "While crossing on the way to Jamaica I learned that the purser of the boat (Mr. F. W. Buxton) was a collector. I soon made friends with him and asked him the question how *Anosia plexippus* gets over to England. He at once said, 'I will tell you. When we leave Norfolk, Va., in the autumn there are

always a lot of them flying about the potato locker, which is on deck. There are so many of them that they get shut in, and live on such nourishment as they can extract from the potatoes; when they arrive in dock in England they escape. Last summer we had two all the way over that never left the ship until we arrived at Tilbury, and I saw them fly away there.'” Possibly this may account for the extreme scarcity of this species in Ireland—as it may be remembered the only specimen known to have occurred in that country was one captured by Major Chavasse in Co. Cork in October, 1916, and recorded by me in the ‘Entomologist,’ vol. xlix, p. 285; otherwise it might be supposed that the western coast of Ireland would be the most accessible landing place for these insects after their flight across the Atlantic had they migrated without assistance. In any case the above interesting communication throws a new light on this subject, and my thanks are due to Mr. Pearson for very kindly bringing it to my notice.—F. W. FROHAWK; May, 1921.

CELERIO EUPHORBIE MAURETANICA, STGR., IN PORTO SANTO.—This fine sphingid is not uncommon in the Island of Madeira, where I found the larvæ in 1879. In January of the present year I observed a larva on narrow-leaved spurge in Porto Santo, north of Villa Baleira. This is, I think, the first record of a sphingid from that island. The larva was about 35 mm. long; true legs black, claspers red; caudal horn black, reddish at base; lateral pale yellow stripe with red spot on each segment; dorsal yellow line narrow and interrupted; sublateral large spots transversely elongate, black, with large white pupil; broad sublateral band of yellow dots, its upper edge level with the white pupils of the spots; head dark red. According to Rebel’s recent (1917) revised list, there are only four Madeira sphingidæ in addition to the above—*C. livornica*, Esp., *Herse convolvuli*, L., *Acherontia atropos*, L., and *Macroglossa stellatarum*, L. The Azores have only *A. atropos*, *H. convolvuli*, *D. nerii* and *M. stellatarum*. There are no local subspecies, and it is not unlikely that some of the species at least have been introduced by man. The poverty of these islands in the larger Lepidoptera is also shown by the absence of Arctiidæ in the Azores, while Madeira has only the wide-spread *Deiopeia pulchella*, L. There are no Hesperiidæ in Madeira or the Azores so far as known.—T. D. A. COCKERELL.

THE EARLY SEASON.—We have just passed through a remarkably mild winter with scarcely any frost. But it is a curious fact that on December 11th and 12th we had the heaviest fall of snow that has occurred during the thirty-six years I have lived here. It was nearly calm at the time and the snow came down straight, and covered the ground evenly to the depth of nearly a foot. On the 13th a rapid thaw set in and in less than twenty-four hours it had all disappeared. Since then the weather has been simply wonderful, and for the past month, day after day, the sky has been cloudless, with wind varying between S.E. and N.E., fresh at times and rather keen, but with the temperature generally well above the normal. There has been no rain to speak of since November and the country is getting very dry. I noticed white-thorn bursting into leaf as early as January 28th, and at the present time the woods and hedges are as forward as they

usually are about the middle of May. Yesterday I saw a horse-chestnut in full bloom. This tree is always a fortnight or three weeks earlier than others growing near it—why, it is impossible to say, unless, perhaps, its roots may be near some warm spring. *Pieris rapæ* and *P. napi* are not as numerous as they were this time last year. I saw the first on March 25th, but they were probably out before this. *P. brassicæ* I have not yet seen, but last year I saw one on March 20th, which I think is a pretty early record. Two *Smerinthus ocellatus* were seen "paired" on a post on April 9th—a very early appearance. Several *Chrysophanus phlæas* were flying about the railway bank near Dovercourt Station on the 10th, and *Phlogophora meticulosa* was noticed sitting on a fence on the 11th. On March 22nd I visited Stour Wood for a few hours where I saw several *Brephos parthenias* flying round the young birch trees, and *D. fagella* was plentiful on the oaks—six or seven often close together on one tree, and there were some nice varieties. Larvæ of *Arctia villica* are about a month earlier than last year. I took the first full-grown on March 15th and continued to find them up to the 12th instant, and have now a good number. They commenced to spin up on March 27th, and more than half are already in the pupa state. I hope I may breed some good varieties.—GERVASE F. MATHEW; Lee House, Dovercourt, April 13th, 1921.

EARLY LEPIDOPTERA.—*Pieris rapæ* and *Aglais urticae* were seen flying on March 24th, and a male *Euchloë cardamines* was taken on the 25th. On April 9th *Celastrina argiolus* was noted at Hove, and two specimens of *Phlogophora meticulosa* were captured. Specimens of *Xanthorhoe unangulata* were seen and a female netted on April 12th, and on the 13th of that month a female *Phragmatobia fuliginosa* was secured.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

PYRAMEIS ATALANTA IN MARCH.—On March 26th last I noted a specimen of *P. atalanta* at Bookham Common. There seems no doubt that it had hibernated here.—R. N. GOODMAN, M.S.; Kingston-on-Thames.

RETARDED DEVELOPMENT OF CÆNONYMPHA TIPHON.—In the March number of the 'Entomologist' for the year 1920, vol. liii, p. 66, I recorded the retarded development of five larvæ of this species. Although three of these lived through their second winter only one finally survived to pupate; this took place at the end of May, 1920, and produced a perfect female butterfly on June 16th, 1920. The larval state occupied 21 months 2 weeks. The complete metamorphosis extended from the middle of August, 1918, to the middle of June, 1920.—F. W. FROHAWK.

EARLY APPEARANCE OF CELASTRINA ARGIOLUS AND PIERIS BRASSICÆ. On March 24th last I saw a male *Celastrina argiolus* on the wing, this is the earliest date I know of for this species to make its appearance. At the same moment a male *Gonepteryx rhamni* and an *Aglais urticae* were flying over and feeding on dandelion flowers. On April 1st *Pieris rapæ* appeared and on the following day I saw *P. brassicæ* on the wing, which is a very early date for the latter. The weather on all three days alluded to was fine with cloudless

skies and a temperature of 61, 56 and 62 degrees respectively.—F. W. FROHAWK.

HESPERIA MALVÆ, ETC., IN APRIL.—On April 12th I took seven specimens of *H. malvæ* and one specimen of *Callophrys rubi* on a sunny piece of down near here. I thought this might show what a very early season this must be. I wonder if any readers of the 'Entomologist' have taken either of these species as early as this.—J. M. JAKES; The Red House, Banstead, Surrey.

EARLY BUTTERFLIES.—The following early appearances this year are perhaps worth recording: *Euchloë cardamines*, Balliol College quadrangle on April 2nd; *Pyrameis atalanta*, Bloxworth, Dorset, on April 13th (several flying about wallflowers, etc., among scores of *Vanessa io*).—A. W. PICKARD CAMBRIDGE; Balliol College, Oxford, April 15th, 1921.

AGROTIS SEGETUM IN MARCH.—A specimen of *Agrotis segetum* (apparently fresh) was taken at fallow blossom on March 22nd last. Mr. Capel Hanbury was with me at the time.—G. VERNON BULL, M.D.; Montagu House, Hoddesdon, Herts.

GONODONTIS BIDENTATA IN MARCH.—On March 27th a specimen of *G. bidentata* came to my moth trap. In 1914 the first appearance of this species was on May 4th.—FREDERICK GILLETT (Major); Cheriton House, Sevenoaks, Kent.

EARLY EMERGENCE OF COREMIA UNIDENTARIA.—On March 23rd I took a male specimen of the above insect on a fence in Oxshott village. The identification has been confirmed by Mr. H. Worsley-Wood.—F. G. MANN; 9, Parker Street, Cambridge.

HYLOPHILA PRASINANA IN MAY.—While collecting on May 10th last I took a fine female specimen of *Hylophila prasinana* at rest on a fence in Harpsden Wood, Oxon. This wood is principally composed of beech trees, with a few birch and oak in one clearing. The date seems to be a very early one for this moth.—STANLEY N. A. JACOBS; 5, Exbury Road, Catford Hill, London, S.E. 6.

THERONIA ATALANTÆ, PODA, IN BRITAIN.—When naming some ichneumons last winter I discovered a specimen of this fine insect which was taken or bred by my father, probably in the Colchester district, some twenty or twenty-five years ago. The only known British specimens are 2 ♂ and 2 ♀ in the Stephens Collection and a single specimen taken near Folkestone ('Entom.', 1909, p. 65), all of which are at S. Kensington.—BERNARD S. HARWOOD; Sudbury, Suffolk.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—Wednesday, February 2nd, 1921.—The Rt. Hon. Lord Rothschild, F.R.S., President, in the Chair.—The President announced that he had nominated the following fellows to be Vice-Presidents for the ensuing year: Mr. G. T. Bethune-Baker, Mr. J. Hartley Durrant, and Commander J. J. Walker, R.N. He also announced that three Committees—Finance,

Publications, and Library—had been formed in place of the Business Committee, and the names of the Fellows appointed to serve thereon respectively.—Mr. A. Bacot exhibited living specimens of *Cimex hirundinis*, and gave an account of his breeding experiments therewith.—Dr. K. Jordan exhibited examples of the Saturnian genera *Holocera*, *Ludia*, and *Orthogoniophtilum*, and demonstrated the presence of a kind of stridulating organ, absent in the males; also two species of Graphipterus, *Gr. rotundatus*, Klug, and *Gr. peletieri*, Castln., from Algeria, both provided with stridulating organs. He said that the latter was found in association with *Cicindela touqui*, Guer., and that although the difference was apparent in the cabinet, in Nature they were practically indistinguishable.—Dr. C. J. Gahan remarked on the great interest of the discovery of these organs in the female *Henucha*, the only other instance known to him being that of *Phonaphale*, a genus of beetles of the family *Bostrichidae*.—Mr. O. E. Janson exhibited a fine specimen of *Markia hystrix*, Westw., a rare and remarkable locust from Costa Rica.—Prof. E. B. Poulton, F.R.S., a case of butterflies and mimetic moths which had been observed migrating together from one valley to another in Selangor, F.M.S., and read a letter from Mr. A. R. Anderson, the observer and captor, as to the conditions under which the exhibited specimens were taken. Prof. Poulton also exhibited a female *Hypsa (Asota) alciphron*, Cram., which after inspection had been rejected and neglected by Geckos from Lampur, F.M.S., also examples of *Musca autumnalis*, De G., found hibernating as in previous years at St. Helens, I.W. The numbers appeared to be greater than in any winter except that of 1914–15 (cp. 'Proc. Ent. Soc.', 1915, p. 21).—Mr. H. J. Donisthorpe brought for exhibition a number of workers of *Acanthomyops (Dendrolasius) fuliginosus*, all of which had workers of *A. umbratus* fastened by their mandibles on to their legs, etc., taken at Woking in August, 1915, when a fierce battle was in progress between the two species. It served a good opportunity to establish how soon the Myrmecophils enter the new nest, and those observed in the five ensuing years were also exhibited.—Mr. Lachlan Gibb showed several forms of the female of *Chrysophanus dispar rutilus* bred by Capt. Bagwell Purefoy. After eight years' experimental breeding in this country it was found that the blue sheen on the undersides of the species approximated more generally to that of the extinct form, but the broad orange band on the underside showed a tendency to diminish.—The following papers were read: "Notes on the Orthoptera in the British Museum: (1) The Group of *Euprepocnemini*" by Dr. B. P. Uvarov; "Notes on Synonymy, and on Some Types of Oriental *Carabidae* in various Foreign Collections," by Mr. H. E. Andrews.

March 2nd.—This being the first meeting held at the Society's new premises, 41, Queen's Gate, South Kensington, S.W., the President, the Rt. Hon. Lord Rothschild, F.R.S., delivered an address of welcome to the very large number of Fellows and visitors present. Mr. F. C. Willett, of Sipetong, British North Borneo, was elected a Fellow of the Society.—The President exhibited a collection of gynandromorphous Lepidoptera, including examples of ♂ *Orgyia antiqua*, *Sciapteron dispar*, Stgr., and *Papilio (Troides) haliphron*; also

examples of British caught *Colias croceus* (*edusa*), one having *helice* fore wings and normal hind wings, the other the right side *helice*, the left normal, and a ♂ right side ♂, left ♀ form of *Euchloë cardamines* from Epping Forest.—Prof. E. B. Poulton, F.R.S., brought for exhibition an example of marked irregularity in the colour adjustment of a *Pieris rapæ* pupa to its surroundings; also the wings of the dragonfly *Eschna grandis* left by a sparrow which had attacked the dragonfly and eaten the body.—In the absence of the author, Prof. Poulton then read a paper by Dr. R. C. L. Perkins on "Variation in *Andrena rosæ* and *Andrena trimerana*," illustrated by a long series of examples of both species.—Mr. G. T. Bethune-Baker exhibited specimens of *Lycæninæ* from Provence (France) to show the large proportion of those more or less leaden coloured taken in the summer of 1920. The scales seen under the microscope were found to be in all cases of the kind ill developed.—Mr. H. J. Turner exhibited an example of a Zygænid sent him by Mr. Greer from Tyrone suggesting a natural hybrid between *Z. loniceræ* and *Z. filipendulæ*; also series of the large form of *Z. filipendulæ* occurring abundantly on Box Hill, in which the sixth spot was very weak, and the first to disappear from wear, together with an example of *Z. anceps* recently described by M. Charles Oberthür from Hyères and a short series of *trifolii albiana*, Obthr., from the same locality.—Mr. G. T. Talbot brought a number of specimens of *Euplœa* from the Joicey Collection illustrating a supposed black and white mimetic combination in the Tenimber Islands, Fiji, and Australia; and a white-banded group in the Key and Aru Islands.—Mr. R. Adkin exhibited an example of *Margarodes unionalis* taken at sugar near Arlington, Sussex, a native of southern countries, and probably a migrant to our shores.—Mr. H. J. Donisthorpe exhibited strings of the so-called "ground pearls," being probably a *Margarodes* sp., *M. formicarum*, Guiling, from Jamaica, and two examples of a species of *Cionus* new to science, swept near Lake Windermere a few years since by the Rev. Canon Theodore Wood.—Mr. W. J. Pendlebury showed an unusually dark form of the Carabid beetle *Anchomenus dorsalis* taken in Brecon, and a variety of the mosquito *Theobaldia annulata*, first found in Mesopotamia, and described by Capt. Barraud, R.A.M.C., the specimen exhibited being from Earl's Court, October 27th, 1920, and given the varietal name (in MS.) of *subochrea*, Edwards.—Mr. W. G. Sheldon exhibited a series of 243 bred specimens of *Peronia hastiana*, L., from Sutherlandshire, Wicken Fen, the Isle of Wight and the coast of Lancashire. The series included most of the named forms, and a number of unnamed forms.—Dr. K. Jordan exhibited *Misurgina lata* from Madagascar, remarkable for its very strongly clavate antenna and the development of a stridulating organ. He compared the process with that occurring in other species of *Agaristidæ* and *Noctuidæ*. He said that *Misurgina* recalled *Pemphigostola*, Strand (1909), placed by the author with the *Castniidæ*, but which would on re-examination probably turn out to be an *Agarastid* also.—The following papers were read: "Notes on the Rhopalocera of the Dollman Collection," by N. D. Riley; "The Male Genitalia of *Merope tuber*, Newm. (*Mecoptera*), by F. Muir.

March 16th.—The Rt. Hon. Lord Rothschild, F.R.S., President, in

the Chair.—The President announced that the Rev. George Wheeler had been obliged to resign the Secretaryship on account of ill-health, and that the Council had elected Mr. H. Rowland-Brown in his place. A vote of thanks to Mr. Wheeler for his services, extended over ten years, was proposed by the President, and carried unanimously. The following were elected Fellows of the Society: Capt. K. J. Hayward, Aswân, Egypt; Mr. E. Bolton King, Balliol College, Oxford; Mr. L. M. Pears, West Virginia, U.S.A.; Mr. E. D. Lewis, Swanley, Kent; Mr. W. J. Hall, Cairo, Egypt; Mr. D. Ponniah, Federated Malay States; Mr. H. D. Hope, Jermyn Street, London, S.W.; Prof. Dr. S. Matsumura, Japan; and Prof. C. P. Alexander, Illinois, U.S.A. Prof. E. B. Poulton, F.R.S., exhibited series of butterflies from Central Peru to illustrate the mimetic relationship between *Heliconius notabilis microclea*, Kaye, and *H. xenoclea*, Hew.—Mr. W. J. Kaye suggested that the palatability of the two was probably the same.—Mr. H. J. Donisthorpe gave an account of the latest views on the sub-families of ants, and illustrated his remarks with numerous diagrams.—In connection therewith Mr. W. C. Crawley exhibited representatives of each of the two groups separated by Wheeler, and remarked that the large termite ants could be heard by their kind.—Lt.-Col. Peile, I.M.S., brought for exhibition a collection of butterflies made by him in Mesopotamia. These included a new species of *Lycæna*, with the Blues which it was taken in company with: a new sub-species of *Zegris eupheme* = *dyala*, differing from var. *menestho*, Men., which occurs at Fathah on the right bank of the Tigris, in the absence of the yellow suffusion in the ground-colour of the hind wing, and from ab. *tschudica*, H. = S., in having more white in proportion to the green, and *Melitæa trivia perseæ*, Koll., the three seasonal forms from various localities in Mesopotamia and the North-West Frontier of India.—Mr. E. B. Ashby exhibited an example of *Papilio machaon rufopunctata*, Wheeler, from Les Voirons, Haute-Savoie, and a series of *Parasemia plantaginis* from the Col de Faucille above Gex, Ain, in the French Jura, showing a great diversity of variation. One specimen, he thought, might be referred to *matronalis*, but the President did not support this view, the melanism not being sufficiently pronounced.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, exhibited teratological aberrations of Lepidoptera, and a case containing several new forms of African Rhopalocera. The following papers were then read: "On Some *Chrysomelidæ* (Coleoptera) in the British Museum," by Mr. A. M. Lee; "Types of *Heteromera* described by F. Walker now in the British Museum," by K. G. Blair.—H. ROWLAND-BROWN, M.A., Hon. Secretary.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 10th.—The President in the Chair.—Mr. H. Main exhibited a contrivance he was trying in his breeding-pots to keep the earth damp and at the same time to avoid staleness and mould.—Mr. R. Adkin, a *Pieris brassicæ* with the black apices of the fore wings radiated by yellow streaks, taken at Eastbourne in August, 1920.—Mr. Hy. Turner, a series of *Selidosema plumaria* from Ireland, Co. Tyrone, including a curious streaked melanic male which he had named ab. *intermedia-fumosa*. He also showed a *Zygæna* sent by Mr. Greer from Co. Tyrone as a captured hybrid

between *Z. lonicerae* and *Z. filipendulae*, and pointed out its characteristics.—Mr. B. S. Williams, *Polymommatus icarus* ab. *clara* from Cornwall and Ireland.—Mr. H. Leeds, a very large number of undersides of female *P. icarus*, showing 130 named forms worked out by Tutt's 'British Lepidoptera.'—Mr. K. G. Blair, the bark-boring Scolytid beetles *Xyleborus dispar* and *X. saxeseni* from Kidderminster with burrows in plum-tree, and a *Heliocopris*, sp., from Siam with its dung-ball cut to show egg-cavity.

RECENT LITERATURE.

Memoirs of the Department of Agriculture in India. Vol. vi, Nos. 1-9, November, 1920. Calcutta: Thacker Spink & Co. London: W. Thacker & Co.

A SERIES of papers by the Imperial Entomologist, T. Bainbrigge Fletcher, R.N., F.E.S., etc., dealing with the Pterophorina, Tortricina, Tineinæ and Micropterygina of India so far as the members are at present known.

About 430 species are here referred to. This would seem to indicate that one or more stages in the life-history of at least a sixth of the known species of these families occurring in the Indian Empire have been investigated.

There are 68 plates (some in colour).


Report of the Proceedings of the Third Entomological Meeting, held at Pusa, February, 1919. Edited by T. BAINBRIGGE FLETCHER. 3 vols., pp. xii + 1137, 182 plates. Calcutta, Superintendent of Government Printing, 1920.

THESE three volumes contain an almost verbatim report of the proceedings of the meeting, and cover practically the whole field of entomological work and organisation in India. The meeting was well attended, as the long list of papers—upwards of ninety—read before it clearly shows. The bulk of vol. i is occupied by an "Annotated List of Indian Crop-pests," by T. Bainbrigge Fletcher, the additional matter brought out in discussion being added throughout, and by the Chairman's opening address. Vol. ii mostly contains papers of purely economic interest, among which may be mentioned an exhaustive paper on the "Pink Bollworm in Egypt," by Dr. L. H. Gough, a short but interesting paper on "Some Problems in Forest Insect Control," by C. F. C. Beeson, papers on lac-culture, silkmoths, etc. Vol. iii has a number of papers of more general interest, dealing with such subjects as methods of collecting and preserving specimens, the importance of collecting, preparation of illustrations, by the Chairman, Dr. D. Sharp, Dr. Hankin, A. W. Sclater and C. C. Ghosh, papers of systematic interest, such as that by W. Ormiston on the genitalia of the Hesperidæ of Ceylon, and short notes by Prof. E. B. Poulton, E. Meyrick and Major Fraser on special subjects, mainly Lepidoptera.

The Pusa Institute seems thus to aim at being the home of both pure and applied Entomology in India—a very excellent object. Its attainment would be welcomed alike by the professional and the amateur.

EXCHANGE.

[The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused. *Marked * are bred.*

 **NOTICES OF EXCHANGE** should be received by the 21ST OF EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each

Wanted. Ova or larvae of Carpiini. Can offer *Mendica* larva and many set imagines. -R. T. BOURNEMAN, 68, MORDINGTON ROAD, CHINGFORD, LONDON, E. 4.

Duplicates. Trepidaria, Glabraria, Alternata, Illustraria, Syringaria & c., Gonostigma, Monanthidus (4), Oriaria (3), Interrogations (3), Melanopa, Cordigera, Desulcrata. Larva of P. e-album. B. W. NAVE, LYNDHURST, 95, QUEEN'S ROAD, BROMSWOOD PARK, LONDON, N. 4.

Duplicates. Multistrigaria, Badata, Impluviata, Munda, Capsincola, Cardamines, Astrarche, Corydon, etc. Larvae: Tristata, Suffumata, Chi, etc.; assorted moorland larva, mostly Fumata, Populata, moorland Elutata, *Desulcrata*. Very numerous, especially early stages. T. SMITH, WHISTON EAVES, FROGHALL, STOKES TRENT.

TO CORRESPONDENTS. All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDESBURY, N W 2.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, QUEEN'S GATE, S.W. 7 (nearest stations, South Kensington and Gloucester Road). *June 1st at 8 p.m.* Informal meetings will be held in the Society's rooms from 5-10 p.m. on *June 15th*. Fellows may introduce guests, and a charge of 1s. per head will be made to meet expenses of tea, &c.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1. *Saturday, June 4th* Field Meeting at Eastbourne (whole day). *Thursday, June 9th*, Ordinary Meeting at 7 p.m. *Thursday, June 23rd*, Exhibition of living objects, at 7 p.m. *Saturday, June 25th*, Field Meeting at Chalfont Road. *Hon. Sec.*, STANLEY EDWARDS, F.L.S., &c., 15, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* of each month, and section meetings on the third *Tuesday*. Visitors welcomed at all meetings. *Hon. Sec.*, W. E. GREGG, 41, Belfast Road, N. 16.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

1,000 labels, 9.9. 2,000, 12.9. 3,000, 15.9.

1,000 labels, 9.9. 2,000, 12.9. 3,000, 15.9.

FOR MICROLEPIDOPTERA, &c.

Smallest type made

1,000 labels, 12/- 2,000, 15/- 3,000, 18/-

10.6 13.6 16.6.

16 extra.

Pointers for Aberrations

Please state whether of black, brown, or red, and whether of the body or of the wings.



16 3-

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 4.

CONTENTS.

Origrapta literana, L.: Its Life-Cycle, Distribution, and Variation, W. G. Sheldon, F.Z.S., F.E.S., 129. *Colias edusa*, Fab. (*Croceus*, Fourc.): Its Seasonal Forms, Varieties and Aberrations, H. Rowland-Brown, M.A., F.E.S., 135. Some Notes on the Collection of British Macro-Lepidoptera in the Hope Department of the Oxford University Museum, F. C. Woodforde, B.A., F.E.S. (continued from p. 93), 140. Notes on Lepidoptera at Alton in 1920, E. A. C. Stowell (continued from p. 129), 143.

NOTES AND OBSERVATIONS.—Dusky Male Form of *Dryas paphia*, H. Rowland Brown, 145. On the Appearance of *Anosia plexippus* in Britain, F. W. Frohawk, 145. *Celerio euphorbiae mauretana*, Stgr., in Porto Santo, T. D. A. Cockerell, 146. The Early Season, Gerase F. Mathew, 146. Early Lepidoptera, F. G. S. Bramwell, 147. *Pyrameis atalanta* in March, R. N. Goodman, 147. Retarded Development of *Cænonympha tiphon*, F. W. Frohawk, 147. Early Appearance of *Celastrina argiolus* and *Pieris brassicae*, F. W. Frohawk, 147. *Hesperia malva*, etc., in April, J. M. Jaques, 148. Early Butterflies, A. W. Pickard Cambridge, 148. *Agrotis segetum* in March, G. Vernon Bull, M.D., 148. *Gonodontis bidentata* in March, Frederick Gillett (Major), 148. Early Emergence of *Coremia unidentaria*, F. G. Mann, 148. *Hylophila prasinana* in May, Stanley N. A. Jacobs, 148. *Theronia atalanta*, Poda, in Britain, Bernard S. Harwood, 148.

SOCIETIES.—Entomological Society of London, 148. The South London Entomological and Natural History Society, 151.

RECENT LITERATURE.—Memoirs of the Department of Agriculture in India, 152. Report of the Proceedings of the Third Entomological Meeting, held at Pisa, February, 1919, 152.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed.
Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

JULY, 1921

[No. 698

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S.

CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c.

DR. D. SHARP, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U.

N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S.

W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

30,000 British Micro-Lepidoptera, 800 species, moderate prices; selections on approval; cheap type collections. 200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines): one to six localities, *equal numbers*, neatly and legibly printed on lined paper: 1,000 labels, **9 9**; 2,000, **12 9**; 3,000, **15 9**.

Locality and date only (2 lines): 1,000 labels, **9 -**; 2,000, **12 -**; 3,000, **15 -**.

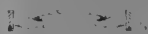
FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** (10 lines), *essential* for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*
1,000 labels, **12 -**; 2,000, **15 -**; 3,000, **18 -**.

Locality and date only (2 lines): 1,000 labels, **10 6**; 2,000, **13 6**; 3,000, **16 6**.

Unequal quantities of localities, etc., or even additional line, in either style of type, **1 6 extra**. See also below, for *Caution* that the average line and character, printed for use.

Pointers for Aberrations



100, **1 6**; 300, **3 -**

Please state by letter *when* for the *quantities* required.

Headings and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

THE ENTOMOLOGIST.

Vol. LIV.]

JULY, 1921.

[No. 698

COLIAS EDUSA, FAB. (*CROCEUS*, FOURC.): ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

· BY H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 140.)

Dr. Rocci* distinguishes the late autumn Ligurian form from that of the *vernalis* form proper. The colour is deep yellow, without the greenish and pallid tint of *vernalis* (spring form). Marginal black bands broad, and of the deep black of the summer form, but less frequently invaded, in the males, by the yellow nervures. In the female the yellow blotches encroach upon the marginal border; they are a little larger, always well defined and complete, the black discoidal spot large and round. The normal flight of *autumnalis* is from the end of October to the middle of November in Liguria, some individuals surviving the winter in mild seasons, and eventually mixing with the true spring emergence.

Dr. Rocci further states that the *Edusa* of Piedmont in its successive emergences does not present as distinct characters as that of Liguria, and the *gen. autumn.* is exceptional. The alpine (single-brooded) form partakes rather of the *gen. vern.* character than of the *gen. æst.* of the plain.

While complete pale forms of the female (= *Helice*, Hb., and *Pallida*, Tutt) occur with (ii) and (iii), there is not yet sufficient evidence to establish a normal occurrence with (i), at least in the North Mediterranean region.

Dr. Verity now informs me that Herr Stauder's var. *Mediterranea* ('Boll. Soc. Adriat.,' xxvii, pp. 105, etc., 1913) is identical with his own *vernalis*; the name therefore falls to it. Fritzsche ("Zur Phänologie von *Colias crocea*, Fourc. [= *Edusa*, F.] nebst ab. *Micans*," 'Iris,' vol. xxxix, pp. 40-45) mentions a February-March emergence distinguished from the type by its size, and constituting a so-called seasonal form throughout the area of distribution (Trieste?). Probably also Failla's ab. *minor* (♂ 33-♀ 44 mm.) may be included in *vernalis*, though small examples of both sexes are taken in all generations, and in some localities are consistent forms, as will be seen in my further remarks on ab. *minor* and var. *Pyrenaica*.

* "Osservazioni sui Lepidotteri di Liguria," *Pieridæ*, 2a Parte, 'Att. Soc. Ligustica Sci. Nat. e Geog.,' Anno xxx, N. 4, 1920.

ABERRANT FORMS.

(A) *Forms Tending to Albinism.*

The oldest described and figured varietal form of *Colias edusa* is that figured and described by Huebner ('Eur. Schmetts,' 1, figs. 440, 441, 1803 ?).

(a) Ab. ♀ *Helice*, Hb. (= *europome*, Stephens). Until Tutt in 1896 invented *Pallida* for the white form, all pale aberrations of the female tending to albinism were lumped together under *Helice*. To take two authors only, Duponchel (vol. i, p. 48) says that the variety (*sic*) is distinguished from the type by the ground-colour of all the wings, and the spot in the marginal band being *whitish*; Barrett, that the *whitish* forms are known by the varietal name of *Helice*. A glance at Huebner's figures is sufficient to convince us that he meant to indicate a form in which the ground-colour was pale *creamy* white, *i. e.* with a tinge of yellow in the pigment. In fig. 440, as seen in the copy in the Library of the Natural History Museum, South Kensington, it is impossible to mistake this creamy tendency—the colour of a vanilla cream ice; but it is only very slightly so, and neither figure displays the same Chinese white used, for example, to depict the male of *Pieris brassicae* (fig. 401). Fig. 441 is even lighter, but still to my eyes separable from the extreme *Pallida* form. The creamy spots in the black marginal bands, of course, vary both in depth of colour and in number and size, as in the typical female. I believe no example of a male *Helice* or *Pallida* has ever been reported authentically, and the same remark applies to the other yellow species of the genus *Colias*. In Barrett's figures (pl. vi, 1c, 1e) both are decidedly cream coloured, 1c less so than 1e.

Ab. *Helice* is then properly described by Tutt as pale lemon or cream yellow. All British examples in my collection, taken at Bonchurch, I.W., August, 1877, correspond to this form. Twelve aberrations of the type are shown, but not numbered, on the excellent plate published in the 'Entomologist' in March, 1878.* In no one of the *Helice* forms figured does the coloration approach that of *Pallida*.

Ab. *Ridicula*, Alpheraky ('Hor. Soc. Ent. Russ.,' vol. xxxviii, p. 519), a South European form, "white as *Helice*, but half as small again," hardly seems worthy of a name; if so, it may be considered generally under ab. *minor*, Failla, and Dr. Verity figures it as such ('Entomologist,' vol. xxxvii, pl. 4, fig. 4).

(b) Ab. *Helicina*, ♀, Oberthür (1880) ('Études Entomologiques,' xx^{me} livr., pl. vi, fig. 96; 'Rhopal. Palæarct.,' pl. xlix, fig. 40). Ground-colour very pale yellow with bright saffron or rosy glaze. Intermediate between the typical yellow and the whitish forms. Described from an example captured in the author's garden at Rennes. There are two British examples in

* '*Colias edusa*,' by Edward A. Fitch, vol. xi, pp. 49-61.

the Oberthür Collection—one from the New Forest, the other from Folkestone. A male form is suggested by pale-coloured examples (? = ab. *chrysotheme*, Stgr.). I have one such caught by the late Rev. H. C. Lang in 1892 at Southend-on-Sea, Essex. It seems to occur on the Continent sporadically, and is stated to be rather rare in Algeria (*cp.*, however, under ab. *Tergestina*, Stauder, *infra*). With regard to the ab. *Aubuissoni* ♀, Caradja ('Iris,' vol. vi, pp. 171–2, "Grosschem. des Dep. de la Haute Garonne, 1893"), a point on which there appears to be some doubt (*cp.* Mr. Wheeler's remarks in his 'Butterflies of Switzerland,' p. 70), I note that M. Oberthür ignores the name entirely as being synonymous with his *Helicina*, though Dr. Verity retains it. It is advisable, therefore, to examine Caradja's diagnosis:

"Aberatio ochracea, alis posterioribus macula media permagna ochracea; est forma intermedia inter *Edusam* et *Helicem*."

And he continues, "It is a form approaching *Helice*, but with all the wings more or less overlaid (*ubergossen*) with bright orange, and in the intensity of the gold coloration more often resembles *Edusa*. The very large deep orange discal spot on the hind wings, which stands out conspicuously from the grey-dusted ground-colour, is also characteristic." In the figured *Helicina* the pale yellow is constant and pervades the ground-colour of the upper side. *Aubuissoni*, on the other hand, from the above description would seem to imply a transitory form to *Helicina* and through it to *Helice*. However, in my opinion it constitutes nothing more than a trivial colour aberration, and I see no reason to maintain a separate name for it. There is what appears to be a very curious *Helicina* × *Helice* hybrid, the last but one of the right-hand series illustrated on Mr. Fitch's plate (*op. et loc. cit.*), and again opposite this figure another with fore wings *Helice* and hind wings *Helicina* rather than *Edusa*. There appears also to be an intermediate Algerian form between *Helice* and *Pallida* with a greenish-white ground-colour described ('Lépid. Comparée,' fasc. x, p. 76), but for which M. Oberthür considers a distinguishing name superfluous.

[*(bbb)* Ab. ♂ ♀ *Tergestina*, Stauder (1913), is described by the author ('Boll. Soc. Adriat.,' vol. xxvii) as "the lemon-and-sulphur yellow aberrational form ♂ ♀." Dr. Verity comments (*in litt.*): "This seems rather confused! The ♀ has the name of *Helicina*, Obthr., already. I have seen the type at Rennes, and it is of a bright lemon yellow. There is no ♂ form that corresponds. Pale males are simply weak individuals, and not a transition to the white *Helice* like the yellow females." I agree with Dr. Verity, to whom I am further indebted for the communication of Herr Stauder's several notes and other valuable information about the species under review. The name *Tergestina*, therefore, is redundant, and falls.]

(c) Ab. ♀ *Pallida*, Tutt (1896). The extreme white form

without a trace of the yellow or creamy white, and with bluish, not greenish, ground-colour. In my own experience abroad this form occurs more frequently than *Helice*. It was comparatively common flying in some rough meadows on the coast a little to the south of Guéthary, Basses-Pyrénées, in July, 1911, and my recollection of my hunt there with Mr. B. C. Warren is that the typical females were in a minority. Those in my collection are remarkable for the failure of the greenish tinge, which becomes bluish, culminating in ab. *Cærulea*, Verity. It would be interesting to have the views of our collectors on the relative proportion of the *Helice* and *Pallida* forms in the field. I do not remember to have observed the two pale forms together in Britain in the great *Edusa* and other years when the species has been abundant.

Is this the third ♂ aberrant form of M. Oberthür's list (*op. cit.*, fasc. iii, pp. 173-75)—“la couleur jaune du fond des ailes très pale”? If so, or even if this be referable rather to *Helice*, it would constitute an exception to the rule that the extreme white and whitish forms are confined to the female. This particular form is stated to occur in Sicily and Corsica.

(d) Ab. ♀ (*vel forma*) *Albissima*, Ragusa. Ground-colour rather pale yellowish white, the median marking, hind wings, white, not orange. Appears to be intermediate between (b) and (c). Rare in Liguria (Rocci).

(e) Ab. ♀ *Cærulea*, Verity ('Entomologist,' vol. xxxvii, p. 54, 1904). This is an extreme aberration, in which, according to the author, the greenish colour of the underside of all the wings is replaced by sky blue with silvery reflections, but in the figure before me ('Rhopal. Palæarct.,' pl. xlvii, fig. 32) it is nearly white, not blue at all. At all events it is one of the most remarkable aberrations of the species figured or described. It was taken on Monte Matanna, Apuane Alps. The greenish colour in *Pallida* is often pale greyish blue, but Dr. Verity is definite that this aberration is sky-blue, and the forms, therefore, should not be identical.

(f) Ab. ♀ *Adoratrix*, Stauder (1913). Described by the author as follows: "A further *Croceus pallida*-and-*helice* form, which bears a very broad marginal band on the upper side of the hind wings; in which, also, the light spots are nearly or entirely missing, and the band of the fore wings is very nearly entirely, or entirely unspotted, I designate as ab. ♀ *Croceus helice* (*pallida*) *adoratrix*, Mihi (types: 3 ♀ ♀ from Trieste, mid-September, 1910-12) ('Boll. Soc. Adriat.,' vol. xxvii, pl. ii, f. 4)."

(g) Ab. ♂ *Cinerascens*, Mihi (1921). A form of the ♂ in which the black markings tend to albinism, and are very pale grey, = No. 3 of the aberrations cited by M. Oberthür ('Lépid. Comparée,' fasc. iii, p. 173; 'Rhopal. Palæarct.,' pl. xlvii, fig. 10, and 'Jahresbericht Wien Ent. Ver.,' 1903, pl. 1, fig. 1).

(h) Ab. *Brunnea*, Tutt (1896). The black replaced by brown.

(i) Ab. *Flavida*, Ksenzopiolisky (1912)? In which the normal orange yellow ground-colour (? both sexes) is tawny. Being unable to verify the reference in the 'Zoological Record,' I leave this aberration in doubt.

(j) Ab. ♀ (*vel. forma*) *Fulvosignata*, Rocci (1920). A form of the *gen. æst.* only: spots in marginal band intense fulvous to orange (? ab. *Flavida*).

(k) Ab. ♂ *Deserticola*, Verity. A small form with very pale whitish-yellow ground-colour ('Rhopal Palæaret.').

M. Oberthür (*op. cit.*, fasc. x, p. 77) says that this form is by no means confined to the desert region of the Algerian Sahara, but is met with elsewhere as an occasional departure from the type.

(l) Ab. *Cremonæ*, Bang-Haas ('Iris,' vol. xxvi, p. 103). A colour form from the Lebanon, chiefly remarkable in that the normal orange colour is primrose as in *C. palæno* ♂ (= *Europomene*, O).

(m) Ab. *Chrysothemeformis*, Verity (1919). Form of the *gen. vern.* in Tuscany "identical with *Chrysotheme*, Esp., except for the patch of androconial scales in the ♂."

(n) Ab. ♂ *Passa*, Verity (1906). Ground-colour very pale yellow. Marginal bands very pale reddish brown. Differs from ab. *Brunnea*, Tutt (*q. v.*), which has the ground-colour deep orange ('Rhopal. Palæaret.,' pl. xlvii, fig. 10).

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

BY W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 135.)

Ab. *romanana*, Fab. (Plate I, fig. 3.)

Synonymy.—*Romanana*, Fab. *Pyrallis mantissa*, ii, p. 234 (1787); Fab., Syst. Ent., tome iii, par. ii, p. 270, No. 119 (1794); Hübner, Tort., fig. 88 (1797) (*literana*); Hübner, Verz., p. 386, No. 3748 (1826) (*notatana*); Snellen, Vlinders, p. 176, No. 4 (1882) (*squamalana*).

Original description.—*Pyrallis romanana*, alis virescentibus albo scabris: lunula media atra. Habitat in Germania australiori. Mus Dom. Romani. Affinis præcedenti (*squamana*) alæ anticæ virescentes punctis plurimus, elevatis, albis. In medio lunula magna, atra. Alæ posticæ fusco cinereæ. Abdomen cinereum linea laterali, fusca.

This beautiful and chaste form is really an aberration of the type-form *literana*, in which all the black markings are wanting with the exception of the central lunule. The clear green disc

of the superiors, having only this elegant lunule to relieve it, makes ab. *romanana* one of the most beautiful of all the forms of this exquisite species. It is extremely well figured by Hübner, fig. 88. As his book is so rare and costly I have figured an example.

So far as I am aware ab. *romanana* is an extremely rare form in Britain. I have three examples which came from the New Forest. There is also one in the National British Collection, but I do not know of any others.

Ab. *griseana*, n. ab.

I give this name to a form which is exactly similar to the type, but it has the ground-colour of the superiors, which in the type is green, light slate-coloured grey.

I have only seen two examples of this form, both of which are in the collection of Mr. South; the type is labelled "28.8.1914"; both are from the New Forest.

A figure is not given of this aberration, as the point of differentiation from the typical *literana*, L., i.e. the grey ground-colour of the superiors, does not show by the half-tone process.

Ab. *fulvoliterana*, n. ab. (Plate I, fig. 4.)

Synonymy.—Hübner, Tort., fig. 91, 1797 (*literana*); Hübner, Verz., p. 386, No. 3750, 1826 (*aerugana*).

The only author who seems to have dealt with this aberration is Hübner, but owing to want of knowledge of what were and what were not species his nomenclature is extremely mixed. In 'Tort.' he figures it (fig. 91), but calls it *literana*; then, subsequently, in 'Verz.,' p. 386, No. 3750, he writes—"figs. 92, 91 *aerugana*"; but fig. 92 represents a form quite different from 91. As he, however, in giving the name *aerugana* places 92 before 91, it is obvious that in priority the former must take the name *aerugana*. and that the latter is at present without a name, and therefore I have given it the above, and describe it as follows:

As *literana*, L., but with a fulvous longitudinal band on the superiors commencing in the centre of the base and forking immediately after leaving it; one branch dies out on the costal margin about two-thirds of its length from the base, the other branch being carried down the centre of the wing until it almost reaches the hind margin, where it terminates.

This extremely handsome form comes nearest to ab. *tricolorana*, Haw., but is distinguishable at once from it by the clear green ground-colour and the absence of black dots, which are found in that aberration. Hübner's figure admirably portrays it.

It is not very rare in the New Forest, from whence I have a beautiful series of twelve examples.

Unfortunately in the figures the longitudinal fulvous bands show very faintly. The example figured has the black markings very strongly developed. These markings vary in strength in *ab. fulvoliterana* as they do in the type form.

Ab. fulvomaculana, n. ab.

I give this name to an aberration which is in all respects similar to the preceding, with the exception that the longitudinal fulvous bands are broken up into blotches, which have portions of the green ground-colour showing between them. It is well figured by Hübner, 'Tort.', fig. 90 (as *literana*).

I cannot find that any other author has treated of this aberration, which is apparently rare. My series of four examples came from the New Forest.

I have not given a figure of this aberration, the fulvous blotches not showing by the half-tone process.

Ab. tricolorana, Haw. (Plate I, fig. 5.)

Synonymy.—*Tricolorana*, Haw., Lep. Brit., p. 411, No. 54 (1803); Stephens, Cat., p. 188, No. 7096 (1829); Curtis, Guide, p. 73 (1829); Rennie, Conspect., p. 179 (1832); Curtis, Brit. Ent., p. 440, No. 3 (1833); Stephens, Haust. iv, p. 165 (1834); Godart et Duponchel, Hist. Nat., ix, p. 128, and pl. 242, fig. 2a (*squamana*) (1834); Wood, Ind. Ent., fig. 1101 (1839); Westwood, Brit. Moths, pl. 96, fig. 13, and p. 164 (1845); Staudinger, Cat. Lep. Eur., p. 94 (1861) and p. 234 (1871); Snellen, Vlinders, p. 176, No. 7 (*literana* and *tricolorana*) (1882); Staudinger, Cat. Pal. Lep., ii, p. 82 (1901); Barrett, Brit. Lep., x, p. 216, and pl. 451, fig. 3b (1905); Spuler, Schmett. Eur., p. 242 (1908); Kennel, Pal. Tort., p. 83 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description.—*Tortrix tricolorana* (the tri-coloured green) *alis cinereo-viridibus, lineolis atomisque atris, striaque furcata ruga*. *Tortrix irroranae varietas?* Hüb., Schmett, tab. 15. Habitat. Quercetis, at rarissime. Imago, f. Sept. Exemplaria perpauca solum vidi. Expansio alarum 9½ lin.

Discriptio. *T. squamanae* nimis affinis, alæ anticæ cinereæ, tinctura viridi, atomis undique parum sparsis nigris. Costa antice, lineolis transversis undulatis, postice, punctis numerosis atrio. Discus literis nebulisque validis itidem atris. Stria rufa extendit—a basi per marginem posticum, et ramulum exserit basin versus, oblique ad medium costæ. Posticæ fuscæ.

This very beautiful form, as before mentioned, comes near to *ab. fulvoliterana*, but it is distinguished from it by the greyer ground-colour and thick sprinkling of black dots on the superiors. It is not by any means abundant, but can hardly be called rare—at any rate in the New Forest. I should consider it the most abundant of the forms with fulvous markings. I have a fine

series of twenty-one examples, and suppose something like 5 per cent. of one's total catch would be represented by it.

Ab. suffusana, ab. n. (Plate I, fig. 10.)

I give this name to a form similar to *ab. tricolorana*, Haw., but with the disc of the superiors more or less suffused with black. I take it this is a modern development tending to an absolutely melanic form. My specimens, seven in number, came from the New Forest.

Ab. abjectana, Hüb.

Synonymy.—*Abjectana*, Hüb., Verz., p. 386, No. 3752 (1826); Hüb., Tort., fig. 97 (1797) (*irrorana*); Snellen, Vlinders, p. 176, No. 1 (*irrorana*) (1882); Standinger, Cat. Pal. Lep., ii, p. 82 (*irrorana*), 1901.

Hübner figures in 'Tort.,' figs. 96 and 97 (1797), two totally distinct forms under the name of *irrorana*: 96 is the true *irrorana*. In 1826, in 'Verzeichnis,' he names fig. 97 *abjectana*; according to his figure it is a dull leaden-coloured insect with obscure darker transverse cloudings, a row of black dots in the costa, and another row on the hind margin at the base of the ciliae.

The only British examples I have seen of this form are three which are in the collection of Mr. R. South; they came from the New Forest.

Ab. squamana, Fab.

Synonymy.—*Squamana*, Fab., Syst. Ent., p. 651 (1775); Thunberg, Ins. Suec., par. iv, p. 21 (1784); Fab. Syst. Ent., tome iii, par. ii, p. 270, No. 118 (1794); Donovan, Brit. Ins., v, pl. 157, fig. 7 (1796); Haworth, Lep. Brit., p. 410, No. 52 (1803); Fröl., Tort. Wurt., p. 18 (1828); Curtis, Guide, p. 173 (1829); Stephens, Cat., p. 188, No. 7095 (1829); Rennie, Conspect., p. 179 (1832); Curtis, Brit. Ent., p. 440, No. 2 (1833); Stephens, Haust., iv., p. 165 (1834); Staudinger, Cat. Lep. Eur., p. 234 (1871); Frey., Lep. Schweiz., p. 284 (1880); Sorhagen, Klein. Schmett. Braud., p. 65 (1886); Staudinger, Cat. Pal. Lep., ii, p. 82 (1901); Barrett, Brit. Lep., x, p. 216, and pl. 451, fig. 3 (1905); Spuler, Schmett. Eur., p. 242 (1908); Kennel, Pal. Tort., taf. v, fig. 3, and p. 83 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (*Pyrallis squamana*, 'Syst. Ent.,' p. 651, No. 36, 1775). --*Pyrallis alis vires centibus, scabris*. Habitat in Anglia. Mus. Monson. Statura. *P. Schallerianae*, at paulo longior, alæ anticæ virides, squamis hinc inde Elevatis scabræ, quæ in medio fere fasciam constituunt. Posticæ cinereæ.

Ab. squamana is certainly the most abundant of any of the

literana forms that are found in Britain; in the New Forest at least half of the specimens taken are referable to it.

Ab. mixtana, n. ab. (Plate I, fig. 7.)

Synonymy.—Hüb., Tort., fig. 94 (1797); Godart et Duponchel, Hist. Nat., ix, p. 128, and pl. 242, fig. 2b (*squamana*) (1834); Wood., Ind. Ent., fig. 1099 (*squamana*) (1839); Snellen, Vlinders, p. 76, No. 3 (*squamalana*) (1882).

Original description.—I give this name to a form not unlike the last, but instead of the plain green scaly superiors there are mixed with the green colour lighter patches; an extreme form is Hübner's fig. 94; but the majority of the British examples come near to Godart and Duponchel's figure, which is a very close approach to our native specimens.

Ab. mixtana is a common form in the New Forest.

(To be continued.)

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 143.)

Lithophane semibrunnea.—Twenty-one with data. Ten from near Oxford, 4 from Cambridge, 3 from Hants, 4 from Surrey.

L. socia.—Over 30 specimens. One from Cornwall, 8 from Devon, the rest from Hants.

Graptolitha furcifera.—Two from the Spilsbury Collection. Four from the Sellon Collection in perfect condition. One, a rather worn specimen from the Chitty Collection, is labelled "Wales, 1888." Another specimen from the Norgate Collection, presented by Mr. B. H. Crabtree, is labelled "Wales."

Cucullia lychnitis.—Nine specimens with full data. Six from Berks, three from Surrey

C. asteris.—Six specimens with data from Surrey and Kent.

C. chamomillæ.—A long series with full data.

C. gnaphalii.—Two specimens without data from the Spilsbury Collection.

C. absinthia.—A long series from Devon and Portland.

Anarta cordigera.—Series of 16 with full data, all from Rannoch.

A. melanopa.—Nineteen with full data, also all from Rannoch.

Heliothis dipsacea.—Thirty-one with full data. Twenty from the New Forest taken by myself. Eight from the Champion Collection, "bred, Chobham, Surrey, 1913." Two from the Meldola Collection, "Maldon, Essex." In one of these last the

dark markings of the underwings, instead of being black, are a pale reddish brown.

H. peltigera.—Ten with full data, 7 from Torquay, 1 from the Isle of Wight, 1 from Bridgwater, 1 from the Sellon Collection, labelled "Sydenham, 6 . 88."

H. armigera.—Three with data. One from the Spilsbury Collection, in fine condition, labelled "Babbicombe, J. Terry, Octr., 1871." One from the Meldola Collection, "Torcross, 29 . 8 . 01." The third from the Sellon Collection, "Kent, Strood, 1878."

Thalpochares parva.—One specimen from the Sellon Collection, labelled "Dover, Cummings Collection."

Erastria venustula.—Twenty-eight with full data. Twenty from the Meldola Collection, "St. Leonards Forest, Sussex." Eight from Brentwood, Essex.

Emmelia trabealis.—Long series from Spilsbury, Chitty and Sellon Collections, but unfortunately all without data. One specimen from the Meldola Collection, labelled "Tuddenham."

QUADRIFINÆ.

Plusia chryson.—Twelve with data. One from Swansea, bred and presented by Mr. W. Holland; the rest from Cambridge.

P. bractea.—Two with data, "Kincardineshire, 1916," presented by Mr. Horne. A fine series of 8 from the Hope and Spilsbury Collections without data.

P. ni.—One specimen from the Meldola Collection, bred in 1906 from ova deposited by a ♀ caught near Tenby by Mr. J. A. Finzi, recorded in 'Entom.,' 1906, p. 212.

P. interrogationis.—Twenty-three with data. Six labelled "Keswick, 1896," the rest from various Scotch localities.

Catocala fraxini.—Four specimens. One from the Hope Collection, much worn and damaged, labelled "Wells' British Collection." One from the Spilsbury Collection, labelled "Whitby." A second from the Spilsbury Collection in good condition is without data. One bred, 1910, by Dr. R. Whitehouse, who presented it to the Collection, from an ovum deposited by a female captured at Horsham, 16 . 7 . 09, by A. James, of Tootham.

C. nupta.—In the long series is one remarkable specimen from the Champion Collection. The usual red bands of the hind wing are of a very dark maroon-brown colour (ab. *brunnescens*, Warren). It was taken on a lamp in Guildford, September 2nd, 1907.

Toxocampa cracca.—Twenty-eight with full data. Twenty-six of these are from N. Cornwall. Two, from the Meldola Collection, are labelled "N. Devon."

HYPENINÆ.

Laspeyria flexula.—Twenty-eight with full data from Dorset, Hants, Oxford, Surrey and Essex.

Parascotia fuliginaria.—Two from the Spilsbury Collection without data.

Zanclognatha emortualis.—One specimen from the Spilsbury Collection, labelled "Loughton, 1870."

Madopa salicalis.—Five specimens, all without data. One from the Hope Collection, two from the Spilsbury, two from the Sellon. The last two have not been reset, and are set very low on very old twist-headed pins.

Herminia cribrumalis.—Twenty-four specimens. Four from the Meldola Collection, labelled "Wicken Fen."

H. derivalis.—Ten specimens with data. Nine from Colchester, one from Abbots Wood.

Hypenodes tanialis and *costæstrigalis*.—A fair series of each species with full data. The same may be said of *Tholomiges turfosalis*.

A BLOOD SUCKING THRIPS.

By C. B. WILLIAMS, M.A., F.E.S.

SOME apology is needed for the notes below, as the insect to which they relate is unidentified, and the solitary specimen obtained has been lost apparently beyond hope of recovery. In view, however, of the fact that a blood-sucking habit is quite unrecorded among the Thysanoptera, it was thought as well to publish the notes in their present incomplete state rather than wait an unknown length of time until the discovery of another specimen of the thrips.

On May 13th, 1918, in the Island of Trinidad, British West Indies, Mr. F. W. Urich, Entomologist to the Board of Agriculture, gave me a thrips alive in a tube with the information that it had settled on his wrist the previous afternoon, waved its abdomen from side to side and sucked his blood for about five minutes, causing a hot pain similar to that caused by sand-flies (*Psychodidæ*), and leaving three small red punctures.

I placed the tube containing the thrips mouth downward over my wrist and obtained immediate confirmation of Mr. Urich's interesting observation. After walking for less than half an inch on my wrist the thrips selected a suitable spot and then pierced the skin with its mouth-parts, causing an immediate hot burning sensation. It remained sucking in the same spot for over half an hour, causing a sudden sharp pain about once every minute.

Even after half an hour it only stopped because I accidentally disturbed it. Its body was then distended and pale reddish in colour owing to the blood contained in it.

It raised on my wrist a small white lump about twice the size of the thrips in diameter surrounded by an irregular blotched area about $\frac{3}{4}$ in. by $\frac{1}{2}$ in. in size.

An hour after the red blotched area had gone but the smaller white raised area was still visible; after two hours only a small red mark at the point of the bite was visible.

The specimen was mounted but has been lost. It was of the family Phlæothripidæ, of the sub-order Tubulifera, of medium size (2 or 3 mm.), and from a rough examination I had believed it to belong somewhere near the genus *Trichothrips*.

Trinidad;
January, 1921.

THE HETEROPTERA OF INDO-CHINA.

By W. L. DISTANT.

This communication is in continuation of some which have already appeared in the 'Entomologist' (vols. li, lii and liii), and are fragmentary according to material received.

The specimens have been sent by Mon. R. Vitalis de Salvaza, who hopes at some interval to produce a large work on the insect fauna of this interesting region.

Fam. PENTATOMIDÆ.

Sub-Fam. TESSERATOMINÆ.

<i>Neosalica nigrovittata</i> , sp. n.	<i>Eurostus heros</i> , Bredd.
<i>Tesseratoma nigroscutellata</i> , sp. n.	<i>Mattiphus jaspideus</i> , H. S.
" <i>quadrata</i> , Dist.	" <i>splendidus</i> , sp. n.
" <i>javanica</i> , Thunb.	<i>Xiengia elongata</i> , gen. n., sp. n.
<i>Vitruvius insignis</i> , Dist.	<i>Asiarcha nigridorsis</i> , Stål.
<i>Eusthenes robustus</i> , Lep. & Serv.	<i>Carpone amplicollis</i> , Stål.
" <i>humeralis</i> , sp. n.	" <i>angulata</i> , Stål.
" <i>sævus</i> , Stål.	<i>Pycanum ochraceum</i> , Stål.
" <i>rubefactus</i> , Dist.	" <i>ponderosum</i> , Stål.
" <i>scutellaris</i> , H. S.	<i>Dalcantha alata</i> , Bredd.

NEOSALICA.

Neosalica, Dist., 'Ent. Month. Mag.', xix, p. 157 (1882).
Mesolea, Bredd., 'Wien Ent. Zeit.', xxi, p. 99 (1902).

Neosalica nigrovittata, sp. n.

Dull dark ochraceous, membrane shining cupreus; antennæ, lateral margins of pronotum and the lateral pronotal angles, two central longitudinal fasciæ not reaching anterior margin and a transverse line before anterior margin, three spots at base of scutellum, about two-thirds of the lateral margins, and the apical

margin of same, lateral margins of sternum, bases of coxæ, abdominal spiracles and upper and inner margins of outer areas to abdominal segments, black; connexivum ochraceous with black spots at the union of the segments; legs piceous; rostrum ochraceous, slightly passing the anterior coxæ; antennæ with the first and third joints shortest and subequal in length, second and fourth longest, fifth shorter than fourth; upper surface more or less transversely wrinkled and finely thickly punctate; scutellum centrally longitudinally ridged, the posterior segmental lateral angles shortly spinous.

Long, 22–29 mm.

Tonkin.

Tesseratoma nigroscutellata, sp. n.

Head and antennæ black; pronotum dark ochraceous or very pale castaneous, anterior and anterior lateral areas black; scutellum dark ochraceous on basal area, remaining area and apex black; corium dark, sometimes pale ochraceous, membrane very pale ochraceous; body beneath, rostrum and legs piceous; body beneath sometimes almost completely covered with greyish-white suffusion; wings ochraceous, widely margined with fuscous-brown; antennæ stout, third joint slightly shorter than second or fourth; head above moderately concave; body above thickly somewhat finely punctate; pronotum with the margins moderately subquadrate, at anterior angles distinctly compressed; scutellum on the apical black area coarsely punctate, the apex broadly, centrally, longitudinally sulcate; sternum considerably elevated centrally, and most prominently near the anterior coxæ.

Long, 27–32 mm.; breadth at pronotal angles, 14–17 mm.

Tonkin; Haut Mékong.

Eusthenes humeralis, sp. n.

Head, pronotum and scutellum more or less olivaceous, corium castaneous-brown; membrane shining castaneous; sternum shining virescent; head beneath, basal joint of antennæ, rostrum, coxæ, trochanters, legs and metasternal elevation more or less brownish or brownish-ochraceous; antennæ fuscous, with the second and fourth joints longest; pronotum with the lateral angles broadly prominent, the lateral angles and margins more or less subrugosely punctate; scutellum with about basal half strongly transversely rugose, the apex concave; corium very thickly and very finely punctate; connexivum above dark olivaceous, with the base of each segment ochraceously maculate; posterior femora very robust, with a long curved spine beneath before middle, and with shorter and more obsolete spines near apex.

Long, 30 mm.; breadth between pronotal angles, 17 mm.

Tonkin.

Eusthenes rubefactus.

Eusthenes rubefactus, Dist., 'Trans. Ent. Soc. Lond.,' 1901, p. 111; *id.*, 'Faun. B. Ind. Rhynch.,' i, p. 267 (1902).

Eusthenes diomedes, Bredd., 'Wien Ent. Zeit.,' xxiii, p. 15 (1904).
Tonkin, Burma.

. *Mattiphus splendidus*, sp. n.

Head, pronotum and scutellum resplendent green, corium pale castaneous with greenish reflexions, membrane very pale castaneous; body beneath resplendent-green or golden-green; head beneath, rostrum and legs pale castaneous; antennæ castaneous, becoming darker towards apex, second joint longest, third a little shorter than fourth; pronotum and scutellum more or less finely transversely wrinkled; corium thickly but very finely punctate.

Long, 23-25 mm.; breadth between pronotal angles, 11-12 mm.

Haut-Mékong.

Allied to *M. jaspideus*, H. Sch., but with the lateral margins of the pronotum more uniformly rounded.

XIENGIA, gen. nov.

Body elongate, about twice as long as breadth between pronotal angles, distinctly narrowing towards apex; head about as long as breadth between eyes, obliquely depressed, somewhat convex on basal area between eyes; ocelli placed close to eyes; rostrum reaching or very slightly passing the anterior coxæ; antennæ with the basal joint moderately thickened, second joint considerably longer than first; pronotum laterally and angularly dilated, the lateral angles broad, but apically finely and spinosely transversely produced, anterior pronotal area acutely depressed; scutellum much longer than broad at base, a little before apex somewhat suddenly narrowed, the base slightly convex; mesosternum centrally ridged or keeled; tibiæ moderately compressed or sulcate on apical halves.

I have placed this genus near *Origanus*, Dist.

Xiengia elongata, sp. n.

Ochraceous; eyes and a prominent apical spot to scutellum, black; head and anterior area of pronotum paler in hue than the basal pronotal area; membrane paler and brighter in hue; body beneath and legs ochraceous; antennæ ochraceous, apex of second joint black (remaining joints mutilated); anterior area of head and anterior and lateral pronotal margins more or less speckled with black, the anterior lateral margins serrate, the posterior area darker in hue and somewhat thickly and strongly rugulose, the lateral angles transversely, spinously produced; scutellum rugulose and punctate; body beneath and legs ochraceous; rostrum robust, just passing the anterior coxæ, finely, centrally, longitudinally channelled beneath.

Long, 33 mm.; breadth between anterior pronotal angles, 17½ mm.

Xieng Khouang.

Subfam. DINIDORINÆ.

<i>Cyclopelta abdominalis</i> , Dist.	<i>Aspongopus brunneus</i> , Thunb.
✓ " <i>rugosa</i> , sp. n.	✓ " <i>laosanus</i> , sp. n.
✓ " <i>obscura</i> , Lepell. and Serv.	✓ <i>Megymenum brevicorne</i> , Fabr.
✓ <i>Aspongopus fuscus</i> , Westw.	✓ " <i>mekongum</i> , sp. n.
✓ " <i>nigriventris</i> , Westw.	✓ " <i>parallelum</i> , Voll.
✓ " <i>chinensis</i> , Dall.	✓ " <i>spinosum</i> , Burm.

Cyclopelta rugosa, sp. n.

Dark bronzy-brown; head, anterior half of pronotum, about apical half of scutellum, and the corium more or less olivaceous-green; body beneath and legs more or less castaneous, the tibiae, spiracles, and extreme lateral margin to abdomen distinctly darker in hue; antennæ black, second joint longest and moderately compressed, third joint short, fourth less compressed, longer than third, shorter than second; pronotum finely punctate and transversely rugulose, with a more or less distinct, central, longitudinal carinate line; scutellum more or less transversely rugose, on basal and apical areas more obliquely rugose; corium more or less irregularly rugulose; rostrum about reaching the intermediate coxæ; anterior femora distinctly spined beneath on apical area.

Long, 12 mm.

Xieng Khouang.

The apex of the scutellum is more rounded and less angulate than in *C. parva*, Dist., or *C. abdominalis*, Dist.

Aspongopus laosanus, sp. n.

Black; lateral margins of pronotum, about basal half of lateral margins of corium, connexivum and lateral margins of sternum and abdomen beneath, sanguineous. Antennæ robust, five-jointed, fourth and fifth joints longest, subequal in length, second and third joints short and also subequal in length, first joint shortly passing apex of head, second, third and fourth joints obscurely sulcate; body above very finely, thickly and somewhat obscurely punctate; scutellum somewhat obscurely, transversely rugose; membrane slightly passing the abdominal apex; rostrum not quite reaching the intermediate coxæ, its base dull reddish; body beneath thickly finely punctate.

Long, 15–16 mm.

Haut Mékong; Laos, Xieng Khouang.

Allied *A. marginatus*, Costa.

Megymenum mekongum, sp. n.

Dull dark blackish-brown; membrane dull ochraceous, the venation darker and subprominent; head above with the lobes broadly, concavely excavate, their apices distinctly cleft; antennæ robust, not nearly reaching apex of head, second joint longest, third and fourth subequal in length, fourth slender, ochraceous, blackish-brown at base; pronotum rugose, with a short curved spine on each side behind eyes, the anterior lateral areas thickly rugose, roundly and a little upwardly produced, near their bases a short obtuse spine on the lateral margins, behind head with a distinct circular concave protuberance, and with a distinct central excavate central line on posterior area; scutellum about as long as breadth at base, more or less transversely rugose, and with a distinct central, longitudinal raised line; membrane not reaching abdominal apex, the veins prominent; rostrum reaching the intermediate coxæ; abdomen

beneath with a more or less obscure metallic lustre; posterior lateral margins of the segments concavely produced.

Long, 17 mm.; breadth between pronotal angles, 8 mm.

Luang Prabang, Muong Yon; Haut Mekong, Vien Ponkha.

Allied to *M. parallelum*, Voll.

Subfam. PHYLLOCEPHALINÆ.

Cressona valida, Dall.

✓ *Diplorhinus coloratus*, sp. n.

Chalcopsis glandulosa, Wolff.

Tetroda histeroides, Fabr.

Metonymia scabrata, Dist.

„ *denticulifera*, Bergr.

Salvianus vitalisanus, sp. n.

„ *latula*, sp. n.

„ *dilatata*, Dist.

✓ *Megarhynchus rostratus*, Fabr.

Gonopsis coccinea, Walk.

„ *truncatus*, Westw.

„ *tonkinensis*, Bredd.

„ *limatus*, H. Sch.

„ *salvazana*, sp. n.

Salvianus vitalisanus, sp. n.

Castaneous-brown; head, anterior area of pronotum and the scutellum dull dark ochraceous; membrane greyish; antennæ ochraceous, apical joint, excluding extreme base, black, second and fourth joints equal in length, third shortest, fifth longest; anterior area of pronotum with two transverse darker fasciate lines, the lateral angles somewhat forwardly produced, their apices black, posterior pronotal area, corium and the scutellum more or less rugosely punctate; membranal veins more or less ochraceous; body beneath and legs paler and more ochraceous in hue; rostrum ochraceous, its extreme apex black and reaching the anterior coxæ; prosternum paler in hue and coarsely punctate.

Long, 16–18 mm.; breadth between pronotal angles, 12–15 mm.

Tonkin, Chapa; Laos, Xieng Khouang.

Gonopsis salvazana, sp. n.

Head, pronotum, scutellum and corium dull ochraceous, darkly punctate, the punctures black on head, anterior half of pronotum and the corium, a short transverse series of small spots on anterior pronotal area behind head, the margin of pronotal lateral angles and two small contiguous spots on apical area of scutellum, black; membrane pale bronzy-brown, the veins prominent and a little darker in hue; antennæ reddish-ochraceous, first and third joints subequal in length, each much shorter than second, remaining joints mutilated; head, pronotum and corium, finely, somewhat thickly blackly punctate, scutellum more rugosely punctate; body beneath thickly, somewhat coarsely, darkly punctate.

Long, ♀ 16 mm.; breadth between pronotal angles, 9½ mm.

Thadna.

Diplorhinus coloratus, sp. n.

Head and pronotum sanguineous, the apices of the lobes of the first and a broad transverse fascia between and including the pronotal lateral spines, black; scutellum black, its base sanguineous; corium ochraceous, sanguineous at base and black on lateral marginal

areas, membrane ochraceous; connexivum black; body beneath sanguineous; legs black; antennæ fuscous, second joint longer than either third or fourth, fifth joint longest; body above thickly, coarsely punctate, base of scutellum transversely wrinkled; rostrum about or only just reaching anterior coxæ; mesosternum centrally carinate; head about as long as pronotum, the lateral lobes prolonged, widely separated, their apices acuminate; lateral pronotal angles acuminate and concavely forwardly produced.

Long, 17–20 mm.

Tonkin.

It is probable that this beautiful species may be entitled to generic consideration.

Tetroda denticulifera, Bergr., 'Ann. Nat. Hist.,' xv, p. 488 (1915). Tonkin.

If I have correctly identified Bergroth's species, it is much more closely allied to *T. histerodes*, Fabr., than to *T. obtusa*, Dall.

Tetroda latula, sp. n.

Dark brownish-ochraceous; two small transverse spots near middle of anterior margin of pronotum, black; scutellum with a small ochraceous spot more or less margined with black in each basal angle; lateral lobes of the head broad, well separated, their apices rounded and their upper surfaces moderately concave; pronotum distinctly transversely ridged near basal area, the anterior lateral angles subacutely and a little upwardly produced; scutellum rugosely punctate, apex somewhat broad and angularly rounded; corium finely punctate, with a pale longitudinal submarginal fascia; body beneath and legs brownish-ochraceous; antennæ mutilated.

Long, 12 mm.

Laos; Pak Vet, Nam Khane R.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE
GROUP COLASPINI.

By FRED. C. BOWDITCH.

(Continued from p. 76.)

Colaspis tucumanensis, sp. nov.

Medium sized. Testaceous brown, body beneath, head above and extreme margins of the thorax and elytra metallic green, thorax very densely and evenly punctate; elytra regularly geminate punctate, becoming single at apex; intervals regularly elevate costate, basal depression nearly obsolete; hind tibia of ♂ slightly dilated within, at the posterior half.

Types, Argentina, Prov. Tucuman, two ♂, two ♀.

Length, 6 mm.

Head densely punctured with the usual smooth calli, shining; thorax with sides feebly undulate angulate at the middle; scutellum

smooth, shining. The general effect of the dense punctuation is to give the species an opaque appearance; it is very close to *gemellata*, Lef., from Bolivia, but that form has the hind tibia of the ♂ simple, and the punctures are green. The punctures of the elytra are really a close series of foveæ, arranged in pairs and often confluent.

Colaspis viridicollis, sp. nov.

Smaller than *trivialis*, Boh. Body below chestnut brown; head shining brown, tinged with green; thorax very thickly finely punctured, brown, strongly shining greenish, the extreme edges and also the outside edges of the elytra metallic green; elytra brown, strongly greenish iridescent, costate in the ♀, at the apex only ♂.

Types, five ♂, two ♀, Paramba (3500 ft., April, 1897, dry season, Rosenberg).

Length, 4-5 mm.

Head with strong transverse depression between the eyes, vertex tumid; antennæ with joints 7 and 11 darker, thorax strongly bidentate at the sides; the punctuation as usual a little heavier at the sides. Elytra strongly transversely depressed, and also within the shoulder, so that the sutural area is prominently raised (like *Compta*); punctuation fine, fairly regular geminate, the intervals defined, but not raised in the ♂ except at the apex, regularly costate almost from base to apex in ♀, body a little more attenuate in the ♂ than ♀; sometimes the legs are infuscate at the knee and apex of tibia and tarsi. The species goes near *submetallica*, Jac.

Colaspis bolivianus, sp. nov.

Small, like *inconstans*, Lef. Above, bronzed, shining, with more or less greenish tint, lateral and basal thoracic, as well as edges of elytra very narrowly metallic green, bottom of punctures greenish; body below metallic greenish, bronze, the colours predominating according to the angle of vision; legs flavous, thighs tinged with æneous.

Types, four ♂, six ♀, Cochabamba, Boliv. (Germ.).

Length, 3.5-4 mm.

Head finely and evenly punctured, with both transverse and longitudinal depressions; antennæ dark rufous, fuscous at tip; thorax thickly, evenly and strongly punctate, bidentate at the sides (the anterior rather obsolete); transversely depressed before the middle (semi-collared); elytra transversely depressed, with raised scutellar area (like *Compta*); punctures not as strong as thorax, except laterally; lineate next the suture, semi-geminate on the disc, larger, confused, and somewhat confluent laterally, forming transverse rugæ, obsoletely subcostate at apex. Nearly related to *manca*, Er., but much smaller, and without the pronounced metallic greenish or violet colour of that form, which

occurs in numbers from the same locality. The last ventral segment of the ♀'s of both species is strongly serrate.

Colaspis impressipennis, sp. nov.

Medium sized. Below purple black, with sides of thorax and breast more or less metallic; above, dark cyaneous blue, with edges in certain lights picked out very narrowly with cyaneous; antennæ brown (scape tinged with metallic), darker towards the tip; legs purplish black, apex of tibiæ and tarsi fuscous rufous; elytra with transverse basal depression across the elytra.

Type, ♀, Cachabé, low c., January, 1897 (Rosenberg).

Length, 4 mm.

Head transversely depressed and moderately thickly punctate, thorax rather sparsely punctate; coarse and confluent at the sides, which are strongly angulate at the middle and nearly straight at the base (like *cupreovittata*, Lef.); all the angles very marked; scutellum smooth. Elytral punctures rather coarse at the base and sides, confluent at the latter, fairly regularly punctate striate on disc and behind. Size and shape of *gemmula*, Er., but that form has light legs and strongly rugose upper surface.

Colaspis jocosa, sp. nov.

Small, oblong. Below black, sides of prothorax and breast green; above brilliant metallic green; antennæ and legs black; the base of the former and tarsi of the latter semi-rufescent; femora semi-æneous; thorax strongly and rather evenly but not thickly punctate; sides strongly angulate at middle.

Type, two ♀, Rio Juntos, Boliv., green label (Callanga), Peru.

Length, 3-3.5 mm.

Head coarsely punctate, with smooth frontal calli; the usual cross depression poorly defined; thorax strongly transverse, faintly depressed each side of the middle. Elytra with strong humeral and transverse depressions, throwing up the scutellar area as in *Compta*, Lef.; finely geminate punctate striate on disc, coarser at the base and sides, and fine and regularly striate at apex. Very like *pumilio*, Lef., but much larger, and without the cyaneous colour of that species.

Colaspis æneicollis, sp. nov.

Very small. Head, thorax and scutel bright æneous bronze; elytra bright chestnut rufous, with the sides below the shoulder and suture somewhat suffused bronzy; body below and legs opaque rufous, with inflexed sides of thorax bronzed; antennæ rufous, darkened at tip.

Type, ♀, Salinas, Beni R., July, 1895 (Stuart).

Length, 2.5 mm.

Head, with both transverse and longitudinal depressions, finely punctate; thorax finely punctate, sparsely on the disc and rear, crowded and larger on the sides, which are strongly angulate behind the middle and obsoletely sinuate before the angle. Elytra rather obsoletely transversely depressed and showing a scarcely raised scutellar area; finely lineate punctate. From the humerus to the apex the intervals are raised and roughened, so that the outer half of each elytra, especially the shoulders, is covered with raised rugosities; the apex is lineate costate. Nearly allied to *Pusilla*, Lef., but smaller and differently coloured than any of the numerous small forms. I infer from the looks of my examples in certain lights that some would be entirely bronze above, with rufous shoulders.

(To be continued.)

NOTES AND OBSERVATIONS.

THE EMERGENCE OF *PIERIS RAPÆ*.—For some years past I have been experimenting on the pigmentation of this butterfly, and last season, with a view to carrying on my work, I obtained a few ova from the spring brood, *metra*. I was unfortunate with the larvæ, as all died off except two, which duly pupated towards the middle or end of June. However, they did not emerge at the commencement of August, and finally I took the boxes containing the two pupæ into a cold room indoors. To my surprise one of the butterflies emerged on November 11th—a day or two after a fire had been lit in the room for the purpose of airing it. I promptly took the other pupa out-of-doors again, and finally obtained a male imago from it on May 13th. The insect is rather small, its markings are pale, the blotches on the fore wings almost obsolete, and it would probably pass for *metra* anywhere. I think these two emergences open up the interesting question as to whether pupæ from the spring (*metra*) brood do not occasionally stand over till the following year, and emerge in the spring as *metra*, instead of in early August as *rapæ*. In other words, are individuals of this and possibly the other *Pierides* occasionally single brooded? I may add that the insect which I obtained in November was a fine female, dark cream in colour, the colour resembling in tone that of the primrose, without that flower's greenish tinge. I find that as a rule I obtain deep cream or yellow pigmentation in about half the insects I experiment with.—HAROLD D. FORD; Thursby Vicarage, Carlisle.

BRENTHIS EUPHROSYNÉ, AB.—I had the good fortune to capture a specimen of *B. euphrosyne* on Sunday last in which the orange ground was uniformly replaced on the upper side by the palest cream. It is almost white. The black markings are slightly heavier than usual. The insect is in first-class condition.—E. H. SILLS; Sibylla, Bray's Lane, Coventry.

ACRONYCTA ALNI, AB. STEINERTI.—A larva of *Acronycta alni* taken by me on poplar in a garden here on September 16th, 1920, produced the moth on May 10th this year. It proves to be a very fine and large specimen of the melanic var. *steinerti*, Caspari.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan, Lancs.

OPORABIA AUTUMNATA AND AMPHISA PRODROMANA IN GLAMORGAN.—Of a long series of *Oporabia* taken in the neighbourhood of Merthyr Tydfil and sent to Mr. F. N. Pierce for examination in connection with the Faunistic Survey of Glamorgan, over 80 per cent. have been found to be *O. autumnata*. Its occurrence in this district was also suspected by Mr. R. South from specimens of *Oporabia* sent to him in 1910. Among a number of "Micros" also sent to Mr. Pierce through the National Museum of Wales a specimen of *Amphisa prodromana* has been identified. This was taken among *Vaccinium myrtillus* on the hills near Merthyr Tydfil. As I understand each of these species is regarded as a northern insect, it would be interesting to know whether either of them has been previously observed so far south.—G. FLEMING; 26, West Grove, Merthyr Tydfil.

OXIGRAPHA LITERANA IN NORTH OF IRELAND.—Mr. W. G. Sheldon, F.E.S., in his most interesting paper on the above species, states that in Ireland it is only recorded from the counties of Kerry and Cork. May I point out that it is found in several woods in this district (East Tyrone), but not commonly; I have observed it as early as the middle of March (hibernated). Its occurrence in this locality is on a par with that of several other species of Lepidoptera believed to be confined to the south and practically absent in Ulster, such as *Vanessa io* (now abundant), *Agrotis corticea*, *Amphipyra pyramidea* and *Pachys strataria*. No doubt it exists in many Irish counties wherever there is any extent of woodlands.—THOMAS GREER; Stewartstown, Co. Tyrone.

OXIGRAPHA LITERANA IN NORTHUMBERLAND.—In conjunction with Mr. W. G. Sheldon's notes on the distribution of this species in Britain (p. 133, *antea*), in his most interesting paper in the 'Entomologist' for this month, it may be desirable to record that I took it at Kyloe in North Northumberland in 1894. I believe I also found it at Chillingham, in the same district, about the same date, but the note of that must have got mislaid.—GEORGE BOLAM; Alston.

EARLY BUTTERFLIES IN 1921.—The following list of butterflies taken or seen on May 1st in South Bucks perhaps helps to illustrate the general forwardness of insects in the spring: *Pieris brassicæ*, *P. napi*, *P. rapæ*, all abundant. The latter was fairly plentiful as early as April 2nd. *Euchloë cardamines*, males common, females scarce. *Gonepteryx rhamni*, *Aglais urticæ*, *Vanessa io*, the usual hibernated specimens seen. *Brenthis euphrosyne*, just emerging in one sheltered gully in a wood; a short series obtained. *Pararge egeria*, var. *egerides*, abundant in all woods visited; females very large, first seen on April 12th. *P. megæra*, *Callophrys rubi*, one or two obtained. *Nisoniades tages*, fairly well out in one locality. I

expected to find *Celastrina argiolus*, but saw nothing of it.—S. B. HODGSON, 3, Bassett Road, North Kensington, London, W.

PYRAUSTA PURPURALIS IN APRIL.—To add to the long list of early records for 1921 that have been appearing in the 'Entomologist,' it may be of interest to record that I found this species on the wing in Gilderdale Forest, Northumberland, on April 27th last—a most unusual date. Its usual time of appearance here, when it is often abundant, is about the end of June and throughout July.—GEORGE BOLAN, Alston

EMUS HIRTUS IN DORSET.—I took a nice specimen of this scarce beetle, *Emus hirtus*, L., on almost fresh cow-dung on May 31st, while walking over Arne Heath, near Poole Harbour. The day was dullish and not too warm.—F. H. HAINES; Brookside, Winfrith, Dorset.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 24th.*—The President in the Chair.—Mr. W. H. Bristowe, Ashford House, Cobham, Surrey, and Mr. Hy. Ruggles, 146, Southfield Road, Bedford Park, W. 4, were elected members. Lantern-slides were exhibited as follows: Mr. Dennis, details of the structure of an Oribatid mite; Mr. Bunnett, of the fish parasite *Argulus*, species of *Protura*, and the rasp of the field-cricket.—Mr. Leeds exhibited a very long series of the undersides of the male of *Polyommatus icarus* each identified as a named form from Tutt's 'British Lepidoptera.'—Mr. Hy. J. Turner, a bred series of *Morpho laertes* with a coloured photograph of the larvæ, and three *Thysania agrippina*, one, measuring 11 in. in expanse, both species sent from Sao Paulo by Mr. Lindeman.—Mr. Hy. Moore, the Hemipteron *Plataspis vermicellaris* from Nairobi.—Mr. Buckstone, specimens of the water-beetle *Helophorus aquaticus*, taken flying in the sunshine in abundance a few feet from the ground.

March 10th.—The President in the Chair.—Mr. J. Bates, Hornsey, and Major T. M. Cottam, Twickenham, were elected members.—A special exhibition of the genus *Zygæna*.—Mr. Hy. J. Turner, many species representing the different sections of the genus in the Palearctic Region from the British Isles to Japan and from Siberia to the Himalayas.—Mr. G. Talbot, for J. J. Joicey, Esq., showing the variation in *Z. ephialtes*, *Z. frazzini*, *Z. carniolica* and *Z. transalpina*; and extreme confluent black and yellow forms of *Z. trifolii* and *Z. filipendulæ* (British), with a specimen of the last with five wings.—Mr. A. W. Mera, British species including a supposed six-spotted form of *Z. trifolii*.—Mr. B. W. Adkin, British species, including *Z. filipendulæ* with the sixth spot more or less evanescent.—Mr. Leeds, numerous aberrations of the British species.—Mr. Tonge, British species, including *Z. filipendulæ* with very inconspicuously marked sixth spot and very broad hind margin of hind wing in an Eastbourne example.—Mr. Jarrett, *Z. hippocrepidis* from

North Wales and a yellow *Z. filipendulæ*.—Mr. T. H. Grosvenor, British species in long series, and read notes on the variations and the rearing.—Mr. A. W. Buckstone, very long series of British species showing racial characters and some hybrids.—Mr. Barnett, series of British species.—Mr. B. S. Williams, asymmetrical *Vanessa io*, *Polymnatus icarus* aberration in which the *parvipuncta*, *discreta* and *icarinus* forms were united, and a brown suffused underside of the male of the latter species.

March 24th, 1921.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. L. W. Newman exhibited the two forms, all green and green and red, larvæ of *Eumecia phlæas* from Bexley, and reported *Triphæna pronuba* at sawfly.—Mr. Main, the "cellar-beetle," *Blaps mucronata*.—Mr. Edwards, numerous species of *Gnophos* from Central Europe.—Mr. B. S. Williams, aberrations of *Ctenonympha pamphilus* from Scotland and Swanage.—Major Cottam, *Phryxus livornica* from Southbourne, a melanic *Minas tilix*, and ab. *costovata* of *Xanthorhoë fluctuata*.—Mr. Priske read an extract showing the usual newspaper ignorance of scientific facts.—Mr. Grosvenor reported *Pieris rapæ* on March 20th, and that *Zygana trifolii* larvæ had stirred from hibernation.—Mr. Turner, specimens of the *hibernica* race of *Euchloë cardamines*, including a form of *caulosticta* with large discal spot extended along the costa, and the forms *dilatata* and *erxia* with the type form of the South African Pierid *Eronia cleodora*. The abundance of the larvæ of *Abraxas grossulariata* was remarked on and *Pachys strataria* (*prodromaria*) was reported from Finchley.—HY. J. TURNER, Hon. Editor of *Proceedings*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, March 21st, 1921, Mr. Leonard West in the Chair.—Mr. H. M. Hallett, a Vice-President of the Society, sent a paper entitled "Parasitic Wasps and Bees." The author gave a review of practically all that is known of the parasitism of the Hymenoptera, but such a vast subject could not adequately be dealt with in a short paper. Sketches of the life-histories of the parasitic Ichneumonidæ, Chalcididæ, Proctotrypidæ, Chrysididæ and Aculeates were given, difficulties of observation were touched upon and suggestions for future work advanced for the guidance of students of these interesting families.—Mr. Chas. P. Rimmer exhibited a long series of *Cerastis vaccinii* to show the variation of this moth as met with at Delamere Forest. Mr. W. Mansbridge showed *Selenia tetralunaria* which had emerged in a warm room during February.

April 18th, 1921.—This meeting was held at the Liverpool School of Tropical Medicine, Mr. J. W. Griffin, Vice-President, in the Chair.—The members and visitors were received by Prof. Robert Newstead, M.Sc., F.R.S., and the staff of the Entomological Department.—Miss Jessie L. M. Bird, 4, Riverside Road, Aigburth, Liverpool, and Mr. Herbert Leigh-Lye, Holly Lea, Greenbank Road, Liverpool, were elected members of the Society.—Prof. Newstead gave a brief sketch of the work of the Entomological Department since the last visit of the Society. Investigations bearing on questions of public health

had been carried out on behalf of the Ministry of Health, the Port Sanitary Authority and the Public Health Department of the City of Liverpool. At the request of the Canadian Government Prof. Newstead had undertaken an examination of the cargoes of grain ships arriving in this port from Canada, for the presence of infestation by the flour mite, *Aleurobius farinosæ*, which in suitable conditions does immense damage to flour. During the year a very large amount of systematic work had been done. A remarkable new giant scale insect had recently been described by Prof. Newstead as *Aspidoproctus africanus* from Tanganyika Territory. A very large collection of sand-flies (*Phlebotomus*), of which genus at least one species is known to be the carrier of sand-fly fever, had been made by Major A. J. Sinton, V.C., in the North-West Frontier Province of India, and brought to Prof. Newstead to be dealt with; some highly interesting facts regarding the distribution of some of the species were mentioned. A very large and important piece of systematic work had been carried out by Mr. H. F. Carter and Drs. A. Ingram and J. W. Scott Macfie on the blood-sucking midges (*Ceratopogoninae*) of the Gold Coast. A great many new species, representing several different genera, and also a new genus of this family had been described, many being in both the larval and pupal as well as the perfect stage. In most cases important facts as to the breeding-places and bionomics of the different species were recorded. This work is still far from complete, but when finished it will constitute a most important contribution to the literature of this family of tiny but exasperating insects. A new species of Tse-tse fly, *Glossina schwetzi*, had just been described by Prof. Newstead and Miss A. M. Evans. The material had been collected by Dr. J. Schwetz of the Sleeping Sickness Mission of the Belgian Congo, and to him the new fly was dedicated. *Glossina schwetzi* belongs to the group of large Tse-tse flies known as the *fusca* group, the species of which cannot be separated by external characters alone. The Society inspected the Museum, which was not completed on the occasion of the last visit to the School in April, 1920. In the Entomological Section of the Museum was exhibited material connected with the work that the Professor referred to in his short address. The collections of biting flies were on view as well as a number of cases of tropical Coleoptera, Hymenoptera, Neuroptera, etc., of general interest. There were also some living examples of the larvæ of the rot hole breeding mosquitoes, *Anopheles plumbeus* and *Ochlerotatus geniculatus* from the district round Liverpool; also adults of *Culex pipiens* and *Anopheles bifurcatus*. The members of the Entomological Staff were highly gratified at the very keen interest that their visitors showed in the various exhibits and they well deserved the cordial thanks of the Society. During the evening it was announced that Prof. Newstead's chief assistant, Mr. H. F. Carter, had been appointed Malariologist to the Government of Ceylon; accordingly a resolution congratulating Mr. Carter upon having been chosen for such an important appointment was carried unanimously.—WM. MANSBRIDGE, *Hon. Sec.*

EXCHANGE.

The publication of Notices of Exchange, for all Advertisements, in the Entomologist is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to insure the Editor from responsibility, in case the liberty of sale should be abused. *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than SIX LINES can be allowed for each.

Will an Entomologist living on the Continent exchange Continental Rhopalocera for English? Correspondence solicited, also with Scotch, Irish and Channel Island collectors. *M. C. McLeod, Catharion House, Bath.*

Duplicates. A few *Betula* pupa and some over 90 *extrema*. *Desiderata.*—Moss in early stages, especially *Smilis* and *Colburn*. *C. Mellows, The College, Bishop's Stortford.*

Duplicates.—*Filix*, *Populi*, *Ocellatus*, *Lugustris*, *Dispar* large *Sten*, *Russula* *L. L.*, *Pantagnis*, *Manduca*, *Versicolor*, *Carpini*, *B. quercus*, *Potatona*, *Atalanta*, *Ericea*. *Desiderata.*—*Euphydryas* *L. L.*, *Selene* *L. L.*, *Amura* (*Scotena*), *Lincola*. *B. W. Nerve, Lyndhurst, 95, Queen's Road, Brownwood Park, London, N. 1.*

Duplicates.—*Vidua*, *Adippe*, *Aglia*, *Scotia*, *Steylla*, *Vibans*, *A. comma*, *S. populi*, *Pomum*, *Manduca*, *Salses*, *P. populi*, *Fasciata*, *M. rubi*, *Queremaria*, *Rhodania* white pins, *Vernicia*, *Pustulata*, *Annulata*, *Pendulana*, *Amoraria*, *Notata*, *Unifasciata*, *Sexialisata*, *Ruberata*, *Variata* (grey types), *Hastata*, *Picta*, *Unicinctata*, *Tersata*. *Desiderata.*—Numerous, early stages preferred. *C. E. Newham, Rungwood.*

CHANGES OF ADDRESS. *Mr. Bethune Baker to 20, Newbold Terrace, Leamington Spa.* *Mr. C. B. Williams to Ministry of Agriculture, Cairo, Egypt.*

TO CORRESPONDENTS. All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor.

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDESBURY, N.W. 2.

MEETINGS OF SOCIETIES.

Entomological Society of London, 41, Queen's Gate, S.W. 7 nearest stations, South Kensington and Gloucester Road. *October 5th and 19th at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1. Ordinary Meetings at 7 p.m. *Thursdays, July 14th, discussion, Xanthopan curvata, and X. severata, July 28th.* Hon. Sec., STANLEY EDWARDS, F.L.S., F.E.S., 1a, St. Germain's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 10, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Fall Society meetings are held on the first *Thursday* of each month, and lecture meetings on the third *Thursday*. Visitors welcomed at all meetings. Hon. Sec., W. L. GILL, 41, Tottenham Court Rd., N. 16.

CONTENTS.

Colias edusa, Early *Græcius*, Fourc.): Its Seasonal Forms, Varieties and Aberrations, *The Highland-Brewn, M.A., F.E.S.* (continued from p. 140), 153. *Oxygrapha literana*, L.: Its Life-Cycle, Distribution, and Variation, *W. G. Sheblong F.Z.S., F.E.S.* (continued from p. 135), 157. Some Notes on the Collection of British Macro-Lepidoptera in the Hope Department of the Oxford University Museum, *F. C. Woodforde, B.A., F.E.S.* (continued from p. 143), 161. A Blood-Sucking Thrips, *C. B. Williams, M.A., F.E.S.*, 163. The Heteroptera of Indo-China, *W. L. Distant*, 164. South American Eumolpidae, Mostly of the Group Colaspini, *Fred C. Borditch* (continued from p. 76), 169.

NOTES AND OBSERVATIONS. — The Emergence of *Pieris rapæ*, *Harold D. Ford*, 172. *Brenthis euphrosyne*, ab., *F. H. Sells*, 172. *Aeronycta alni*, ab., *stemerti*, *G. H. E. Hopkins*, 173. *Oporabia autumnata* and *Amphisa prodromana* in Glamorgan, *G. Fleming*, 173. *Oxygrapha literana* in North of Ireland, *Thomas Greer*, 173. *Oxygrapha literana* in Northumberland, *George Tolam*, 173. Early Butterflies in 1921, *S. B. Hodgson*, 173. *Tyranota purpuraria* in April, *George Boland*, 174. *Emus hirtus* in Dorset, *F. H. Haines*, 174.

SOCIETIES. — The South London Entomological and Natural History Society, 174. Lancashire and Cheshire Entomological Society, 175.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1911 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each; double numbers, 1s. 6d.; 1917 and 1918, 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 13) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s.

CABINETS.

Finest Materials. Best Workmanship. Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

AUGUST, 1921

[No. 699

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., M.C. DR. D. SHARP, F.R.S., F.E.S., M.C.

F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C.1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also
Birds' Eggs
(Singles as well as in Clutches)

OUR CATALOGUE WILL BE SENT POST-FREE ON APPLICATION
36, Strand, London, W.C. 2.

COLOMBIAN BUTTERFLIES WHOLESALE.

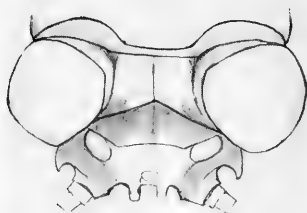
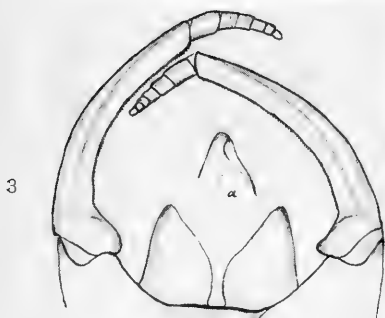
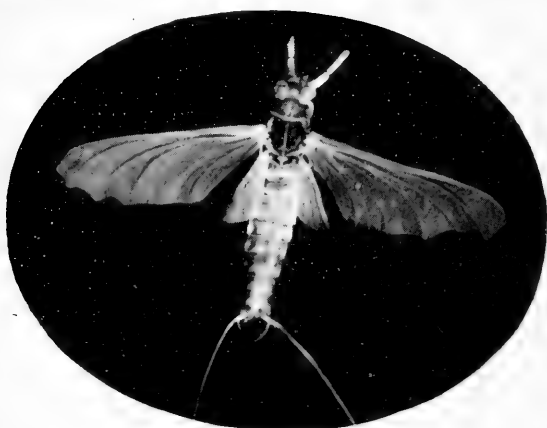
I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies, first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

Albert H. Thompson, 54 Church Rd., Northwich
European and Exotic Papered Butterflies
Set to Order in Any Style.



Palingenia mesopotamica.

Photo. R. M. Adam,
M. E. Mosely.

K. J. M. del.

THE ENTOMOLOGIST.

VOL. LIV.]

AUGUST, 1921.

[No. 699

A NEW SPECIES OF MAYFLY, *PALINGENIA* (*SENSU LATO*), FROM MESOPOTAMIA.

BY KENNETH J. MORTON, F.E.S.

(Plate II.)

ALTHOUGH this species of *Ephemeroptera*, so remarkable in its appearance, and on account of the vast numbers in which it emerges during a very short period from the waters of the Tigris and (it is assumed) the Euphrates, may have been noticed by other officers serving in Mesopotamia, yet as far as I know there have been no specimens sent home excepting by Capt. P. A. Buxton and Capt. W. Edgar Evans. That it was so noticed may be gathered from "Notes on Some Asiatic Species of *Palingenia*," by F. H. Gravely ('Records of the Indian Museum,' vol. xviii, pt. 3, pp. 139-143, pls. xviii-xx, April, 1920), who, under the heading "*Palingenia* (s. str.)? *longicauda*, Oliv., *Palingenia* sp. (? *robusta*), Needham, from Seistan," says: "The species probably occurs also in Mesopotamia, as Major Connor writes that he saw millions of the large mayflies on the Euphrates at the beginning of April. They were being eaten up by the ordinary Caspian river tortoise as they lay in heaps in eddies or slack waters. They swarm in the river even as far down as Basra." As the Mesopotamian species is apparently new I describe it as follows:

Palingenia mesopotamica, n. sp.

♂ (dried). Head above dull black, sordid white in front and also posteriorly. Pronotum transverse broader posteriorly, anterior margin sinuous, produced in the middle; posterior margin nearly straight; dull blackish sordid white in the middle and at the sides, sternum black. Mesonotum dull deep black, sutures white, a fine white median line, sternum black. Metanotum in its anterior part black with a white median spot. Legs white, anterior ivory white, slightly tinged with fuscous on the coxæ and trochanters. Wings sub-opaque, ochraceous, slightly paler towards the base; they shrivel at the tip when dried. Abdomen robust, of nearly equal breadth to the thorax only slightly narrower in the apical segments, mainly brownish above; posterior margin of segments narrowly whitish; forceps limbs and penis lobes ivory white, setæ ribbon-like,

about $1\frac{1}{2}$ times as long as the abdomen, the joints indistinct. Abdomen beneath whitish or yellowish with a dark line on most of the segments at the lateral borders.

Examples of both sexes in fluid do not differ much from the dried specimens. Dark markings on head more clearly defined (see Fig. 4); a small projection on each side at the eyes and two projecting lobes in front in the middle. The fore legs have fine black lines at the base of the coxæ, trochanters, tibiæ and tarsi, the joints of the tarsi also faintly annulated; these markings less evident on the other legs. Wings almost white and translucent. The abdomen is rather paler than in the dried specimens and the segments show on the middle above two pairs of faint paler divergent lines sometimes macular. Setæ pubescent with uniform hair. Wings apparently unfringed. There are two elongate tubercles at the apex of the fore tibiæ in the ♀.

Length of body (from front of head to apex of abdomen, ex. forceps in ♂), 20–21 mm.

Length of fore wing, 20–22 mm.

Length of hind wing, 8–8½ mm.

Two ♂♂ (dried), 7 ♂♂, 7 ♀♀ (in fluid), Buxton; 3 ♂♂ (dried), Evans: All from Amara, April 4th, 1918.

Ulmer, "Übersicht über die Gattungen der Ephemeropteren," 'Stettiner Entom. Zeit.', lxxxi, 1920, divides the genus *Palingenia*, Burmeister, restricted Eaton, into three genera: *Palingenia*, *Anagenesia* (Eaton's sub-genus), and *Plethogenesis*, Ulmer. The present species does not agree with any of these, and if Ulmer's genera be adopted, a new genus will fall to be erected for its reception. The following characters in *P. mesopotamica* may be noted:

(1) Forceps-limbs 7-jointed, a long basal one, the others short, as in *Palingenia* restricted.

(2) Media of fore wing forked before middle of wing.

Lower branch of cubitus and intermediate cubital vein may arise from anal vein 1 (this character appears to be unstable and these veins may sometimes arise as in *Palingenia* from upper branch of cubitus):

In anal area 1, usually only one long intermediate vein.

Female setæ half as long as the abdomen (there is a minute intermediate seta in both sexes).

Fore tarsus of ♂ only about as long as the femur (tarsus 2 mm., femur about $2\frac{1}{2}$ mm.).

These characters are in common with *Anagenesia* and *Plethogenesis*.

(3) Media of fore wing forked later than sector.

Sub-costa and radius very close but distinctly separated at the apex (not visible in fig. 1, Plate II, but easily seen when the wing is floated out in scalding water).

Head with forked process in front.

Fore legs of ♂ longer and stronger than hind legs; femur nearly $2\frac{1}{2}$ mm., tibia $2\frac{1}{2}$ mm. fully.

Intermediate tarsus about as long as the tibia.

Hinder tarsi 5-jointed, 2-clawed, claws unequal.

All as in *Plethogenesia*.

Ulmer refers to a difference in the tenth sternite in *Anagenesia* compared with that in *Plethogenesia*, but I am unable to follow his meaning in this connection.

With regard to the habits of this insect, Evans notes: "Appeared on the Tigris in several spots in and about Amara on April 4th, 1918. They have not been noticed since. They did not fly in the air, but behaved like hydroplanes, circling and and skimming over the surface of the water, the long "tails" dragging on the surface, the body slightly raised and the wings beating rapidly." Buxton writes: "Amara, April 5th, 1918. Large mayflies floating down stream in huge shoals for some days past; never seem to fly, though ♂ ♂ (?) observed chasing ♀ ♀ (?) along the surface of the water, with much beating of inadequate wings." "After that I never saw them fly, and they got more and more battered by the ripple on the surface of the water. Finished altogether in about a week from their first appearance."

Eaton ("Rev. Mon. of Recent Ephemeridæ," "Trans. Linn. Soc. Lond., 2nd ser., vol. iii, p. 10) says: "The male of *Palingenia* has very short fore legs; and he is mated, not in mid-air, but upon the river amidst crowds of rivals, who pile themselves up upon him and his surroundings until he is overwhelmed by a large struggling mass of them floating down the stream like a heap of foam, whose resting place (in New Guinea at least) is generally found in the mouth of a big fish." Observations on the Mesopotamian species are not as complete as could be wished, but as far as they go, considering the bulky form of the insect, they point to the improbability of its being capable of aerial movements such as are recorded of *P. papuana*.

A reference to the appearance of these countless throngs of *Palingenia* and to their evanescent character in other countries may not be out of place. Eaton (*op. cit.*, p. 28) gives a summary of a passage from Signor d'Albertis' travels regarding the swarming of *P. papuana* on Fly River, New Guinea: "On July 2nd, 1876, a few hours before sunset, we witnessed a strange and magnificent sight produced by an abundance of a species of mayfly actively pursued by the following birds: *Calornis metallica*, *Artamus cucopygialis*, a *Graculus*, a *Eurystomus*, and the commonest white-headed osprey, *Haliastur girrenera*. Simultaneously the insects were being preyed upon by thousands of fishes, who rushed up to seize them whenever they touched the water with their delicate wings. But so profuse was the abun-

dance of the flies that the ravages of all their destroyers caused no appreciable diminution in their numbers. Mile after mile, from bank to bank, the river seemed covered with them, when all at once, as if by signal, the whole of them rose up confusedly, flying aloft in a thousand different directions, producing an effect in the air like that of a heavy fall of snow; then they descended again and the snow seemed to cover the river with a white layer. The males very largely outnumbered the females." Eaton also mentions (*op. cit.*, p. 24) that according to Mr. Snellen, of Rotterdam, Swammerdam's statement that *P. longicauda* appears in vast multitudes during one or two evenings only every year "on or about the Feast of St. John" is generally correct, but the date of the swarm is liable to be earlier in warm seasons, sometimes as early as June 10th. Reference may also be made to the great swarms of *Oligoneuria rhenana* which appear on the Rhine, and whose duration is limited to a day or two (Müller, 'E. M. M.', vol. i, p. 262, and vol. ii, p. 182). *Polymitarcys virgo*, Oliv., another mayfly, also appears in great numbers on some of the larger European rivers, giving rise to the local name "*la manne*," and the accumulations of the dead bodies of this species have in some parts of Germany received the name of "Uferaas."

Mr. Martin E. Mosely, ever ready to assist, kindly made for me a fine series of slides of the wings and other details, and provided the photograph of the whole insect. For the photograph of the wings I am indebted to Mr. R. M. Adam, of the Royal Botanic Gardens here.

EXPLANATION OF PLATE II.

1. Wings of ♂ (\times about 4).
2. Whole insect, ♂ (\times about $1\frac{1}{2}$), setæ incomplete.
3. Forceps of ♂ from beneath; (a) apex of penis lobe from above.
4. Head of ♂ from above; two basal joints of antennæ only shown; position of anterior ocellus uncertain.

Fig. 1, from wings mounted in balsam; the others from examples in fluid.

13, Blackford Road,
Edinburgh;

June 11th, 1920.

SOME UNDESCRIBED RHOPALOCERA IN THE BRITISH MUSEUM (NAT. HIST.).

By N. D. RILEY, F.E.S., F.Z.S.

PAPILIONIDÆ.

Papilio aristæus lenæus f. *interrupta* f. nov.

♂. The form of *P. a. lenæus* in which the yellow discal band of the hind wing upper-side is incomplete is sufficiently common, and also it seems, in the Chaquimayo district at least, in S.E. Peru, sufficiently constant to require a name. In this form typically all trace of the band in question is entirely absent

from area 5, and it is only represented in areas 4 and 6 by a few scattered scales. The remainder of the band is much narrower than in typical *lenæus*. On the under-side the spots composing the same band are very regular, rounded and well separated from each other, and have much less white in their composition than those of typical *lenæus*. The fore wing is quite typical.

B.M. Type No. Rh. 160 ♂; Chaquimayo, S.E. Peru (Watkins).

HESPERIDÆ.

Daimio thetys f. *daiseni*, form nov.

♂. Differs from typical *thetys*, as described and figured by Menetries in 'Cat. Mus. Pet.', p. 126, pl. x, fig. 8, 1857, in that the transverse white band of the hind wing, which in *thetys* is only barely indicated both above and below, is so developed as to form on the upper-side a complete macular band some 3 mm. wide, only becoming slightly diffuse towards costa and inner margin, and below a similar but more diffuse band, nearly twice as wide and running out between the veins in irregular rays, in which minute traces of a darker macular band are discernible. The basal area as far as the white band, except for the costal margin, a large dark oval spot in base of area 7 and a smaller one below in the cell is densely covered with long grey-blue scales.

B.M. Type No. Rh. 141 ♂; Mt. Daisen, Japan.

The type-specimen was obtained by Mr. J. G. Barclay, who has kindly presented it to the Museum. In the same district several others were obtained similar to the type and two males intermediate between them and typical *thetys*, these latter being most like the Amurland form, which frequently has much more obvious traces of the white transverse band on the hind wing than has the Japanese form.

Cogia grandis, sp. nov.

♂. *Upper-side, both wings*: Uniformly dark brown. *Fore wing*: One minute spot in cell at about two-thirds from base, another slightly beyond, close to costa, and a pair just above and beyond cell-end, all semi-hyaline. Two similar very narrow transverse marks across and towards the bases of interspaces 2 and 3. A very fine darker anteciliary line. Fringes lighter brown flecked with black at the extremities of the veins. *Hind wing*: Immaculate. Fringes not flecked with black as in the fore wing, of same shade of brown, but between extremity of vein 2 and anal angle entirely black. A short pencil of hairs of same colour as the wing surface, in the position common to other species of the genus.

Under-side, fore wing: Base, as far as the origin of vein 4, dark brown as above; hyaline markings slightly more pronounced, and also the dark markings of the fringes, than above;

costal, apical and hind-marginal areas blackish, the rest of the wing much paler brown than the basal area, especially along inner margin, and bearing numerous fine dark striæ in the distal portions of areas 1b to 4: a large quadrate light grey patch occupies the area between the hyaline spot in area 3 and the costa, but does not extend distally beyond the minute pair of hyaline spots just above and beyond the end of the cell; a similar much smaller diffuse, rather oval-shaped patch midway between this and the apex. *Hind wing*: Basal three-fourths black, the outer edge very irregular but in general direction straight, not conforming to the contour of the hind margin, and traversed by four narrow, very wavy light grey-brown lines at equal intervals, the basal one very indistinct, mainly apparent towards costa, the second fairly well defined, the third least well defined towards the costa, the last the most irregular but well marked, all conforming in general direction with the contour of the hind margin; the distal fourth light grey with numerous faint darker transverse short striæ; ante-ciliary line interrupted at the veins and forming a series of narrow internervular lunules; fringes as above.

Head, thorax and palpi above dark grey, body and antennæ dark brown, the latter darker distally, the club reddish. Palpi below creamy white, thorax, legs and abdomen greyish white, antennæ rather lighter than above.

♀. Considerably larger than the male, the wings more ample and rounded, the pair of subapical hyaline spots on fore wing supplemented by a further two, all four being in line, the hyaline markings in the cell almost indiscernible above; otherwise as in the male.

Length of fore wing: ♂, 23 mm.; ♀, 27 mm.

B.M. Type No. Rh. 150 ♂, 151 ♀. Both from Chapada, Matto Grosso, Brazil (H. H. Smith).

Paratypes 1 ♂, 1 ♀ from same locality in B.M.; 2 ♀, (March 18th, 1829), 1 ♀ (February 25th, 1829), 1 ♀ (March 25th, 1829), Porto Nacional, Tocantins River, Brazil (Burchell), in Hope Department, Oxford University Museum.

The only point in which the species seems to show much variation is in the size of the hyaline spots on the fore wing; some of these may even be entirely absent, as is not unusual with such markings.

Thracides verecundus, sp. nov.

♂. *Upper-side, both wings*: Greenish brown, more particularly towards base, with numerous hyaline markings. *Fore wing*: Hyaline spots nine in number: an oblong one in cell slightly before origin of vein 3, a straight row of three small, squarish spots forming a subapical bar, and five in a straight line from area 1b to 5, that in area 1b square, not nearly

reaching to vein 2, the next very much larger, triangular, extending right across from vein to vein, the truncated apex just touching vein 3 externally at its origin, that in area 3 squarish, similarly extending from vein to vein, the next linear, reaching from vein 4 to 5, the last (in area 5) a mere point close against vein 5. Fringes concolorous with the wings. No brand. *Hind wing*: Hyaline spots four in number, two in area 4, barely separated, one each in areas 3 and 2, all sub-quadrate, small, forming a transverse row a little beyond the middle and curving slightly towards anal angle. Fringes rather lighter than those of fore wing.

Under-side, fore wing: Hyaline spots precisely as above and also the ground-colour basally. The costa, however, is light grey brown, the anterior half of cell ochreous; a light grey area precedes the subapical spots but is separated from them by a much darker area of the same extent as itself; beyond the subapical spots is a very diffuse light grey diagonal extending to vein 4, and the rest of the wing is greenish ochreous, except areas 1a and 1b, which are darker brown. *Hind wing*: Hyaline spots rather more obvious than on upper-side, basal third pale grey, outer two-thirds light green, shaded either side of the hyaline spots with rather darker; the inner edge of the green area markedly convex, the two areas merging together in areas 1a to 1c, so that these appear to shade from grey basally to darkish green at the margin, tinged with ochreous.

Head, thorax and abdomen above greenish brown, below light grey. Legs light grey-green. Antennæ above black, below brown ringed with light grey. The club, which is rather stout, pale yellowish; the apex and the hook reddish.

♀. Exactly like the male except that it is rather larger and the wings are more ample.

Length of fore wing: ♂, 20 mm.; ♀, 23 mm.

B.M. Type No. Rh. 158 ♂; Trinidad, Dr. F. W. Jackson. 159 ♀; Venezuela (Godman and Salvin Coll.). Paratype ♂, Corcovado Mt., Rio Janeiro, December 6th, 1825 (Burchell) in Hope Department, Oxford University Museum.

Orses metallica, sp. nov.

♀. *Upper-side, fore wing*: Dark brown; the long hair-scales, occupying approximately the basal half of area 1b and the basal three-fourths of area 1a, give brilliant blue and bronze-green reflections at certain angles; a short, narrow yellow spot just below costa midway between base and apex of wing, and a series of three yellowish, semi-transparent spots in a direct line between it and the anal angle; the upper one crescentic, its concave side towards base extending right across cell; the middle one, in area 2, reaching from vein 3 to 2, large, much broader on vein 2 than on vein 3, the increase in its width being on the distal side;

the third much smaller, subquadrate, not extending halfway across area 1b and only divided from the spot in area 2 by vein 2. Two further similar spots about equal in size to the last mentioned are present, one in area 3, at about one-third from its base, oblong, its lower end directed outwardly and resting on vein 3; the other in area 1b, at about two-thirds from base, oval, and lying along vein 1, less translucent. Fringes of same shade of dark brown as the ground-colour of the wing. *Hind wing*: Ground colour as in fore wing, abdominal area greyer, fringes as far as the extremity of vein 1a, creamy yellow. The long hair-scales, which cover rather more than the basal two-thirds of the wing, except for those in areas 1a and 1b, bear the same metallic reflections as those of the fore wing, but the reflections are only visible on the alternate halves of each wing at the same time.

Under-side, fore wing: As above, but metallic scaling only present in the base of cell, extending a little beyond origin of vein 2. The translucent markings as above, but the yellow spot on costa and the lower one in area 1a both much larger and more diffuse, the costal one fused with the spot in the cell, the other nearly reaching the distal spot in area 1b. The ground-colour beyond these spots considerably paler than in the basal half of wing, especially towards apex. Immediately preceding apex is a large, roughly equilateral triangular lilacine patch, its base on the costa. Fringes as above. *Hind wing*: Dark brown as above, but without metallic scaling, basally greyish. Hind margin between the extremities of veins 2 and 8 rather broadly creamy yellow, like the fringes, the latter not yellowish beyond the extremity of vein 1b.

The head (faintly), collar, thorax and abdomen (proximally) above all with metallic reflections like the basal areas of the wings. Palpi anteriorly grey, below white. Thorax and abdomen laterally and ventrally grey. Legs outwardly orange, for the rest yellowish. Antennæ black except for the ventral surface of the club, which is bright yellow.

Length of fore wing: 25.5 mm. (28 mm. in paratype ♀).

B.M. Type No. Rh. 157 ♀. Theresopolis, S. Catharina, Brazil (*ex* Godman and Salvin Coll.).

Paratype ♀ in Hope Dept., Oxford University Museum (Miers Coll.).

COLIAS EDUSA, FAB. (*CROCEUS*, FOURC.): ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 157.)

(B) *Forms Tending to Melanism.*

(o) Ab. ♀ *Melanitica*, Verity (1906). With almost the entire wing area upper side suffused with black (*op. cit.*, pl. xlvii,

fig. 9). The illustration shows that this is practically an identical form, though rather more suffused, with that figured for Mr. Fitch's paper (*op. cit.*), the first of the left-hand column. Similar melanic forms are rare; there is an example in the Natural History Museum Collection.

(p) Ab. ♂ ♀ *Nigrofasciata*, Verity (1906). With the discal spot united on the fore wings to the marginal band by a broad black band; the red spot on the hind wings underside extended in long streaks towards the discal spot ('Rhopal Palæarct.,' pl. xlvii, figs. 8, 9). This is M. Oberthür's ab. 1 (*op. cit.*), and is transitional to the form figured for Mr. Fitch's paper (*op. cit.*), the female second of the right-hand series.

(q) Ab. ♀ *Suffusa*, Tutt (1896). Typical form with strong basal suffusion: *trs. ad Melanitica*.

(r) Ab. ♂ *Striata*, Geest. The dark marginal border extended in rays to the middle of the wings.

(c). *Variation of Colour and Marking.*

(s) Ab. *Velata*, Ragusa (1904). In which the black marginal bands are covered with filmy green scaling (? both sexes). "A Sicilian form" ('Nat. Sicil.,' vol. xvii, p. 42), but by no means confined to the Mediterranean littoral. Translation is not easy; I suggest "filmy" as the nearest equivalent in this connection to "*Velata*" (veiled). I think the filminess may be due to iridescence as in the form *Micans* described below.

(t) ♂ *Atrofasciata*, Rocci (1920). A summer form in which the nervures are indistinguishable to the apex of the fore wings.

(u) Ab. ♀ *Obsoleta*, Tutt (1896). The spots in the marginal (almost or) entirely obsolete. Appears to be synonymous with ab. *Poveli*, Aigner ('Rov. Lapok,' vol. viii, p. 30, 1901).

(v) Ab. ♀ *Subobsoleta*, Rocci (1920). The intermediate form to (q) "with some markings."

(w) Ab. ♂ *Faillæ*, Stef. (1900). With the series of yellow nervures very distinct, and carried right through the marginal bands of all the wings upper side. Sicily. Often occurs near Florence, and no doubt is widely distributed elsewhere.

(x) Ab. ♂ *Helena* H.-S. (1843). Has "a row of yellow blotches just inside, and touching the marginal hind band, which is narrow" (Tutt). Compare the ♀ ab. third of the right-hand series Mr. Fitch's plate (*op. cit.*)

(y) Ab. ♂ *Micans*, Fritsche (= *Micans*, Konas; = *Micans*, Kiefer). The description by the three claimants to name this aberration suggests identity of form. This being so, Fritsche, as the first in the field ('Int. Ent. Zeit.,' Guben, v, 1911, No. 8, p. 55), is entitled by priority to rank as author. Konas's description ('Iris,' vol. xxxiii, p. 17) is dated 1914—*forma nova*. It is a male with a violet lustre present on the hind wings. Kiefer also describes it ('Ent. Rdsch.,' xxx, pp. 32

and 54). Fritsche's description extends the violet lustre, suggestive of *C. aurorina heldreichi*, to all the wings, and he compares it to that of *Apatura iris* and *A. iole*. As we all know, typical ♂ *Edusa* are often suffused with a rosy glow, which may or may not be transient, if, as I suspect, the glow is apparent in all freshly emerged individuals of the *gen. æst.* Mr. Fitch (*op. cit.*) confirms the occurrence of ab. *Micans* in this country in 1877.

(z) Ab. ♀ *Divisa*, Verity. Marginal band hind wings complete; sharply divided by series of light markings which together form a discontinuous line.

(aa) Ab. ♀ *Semidivisa*, Rocci (1920). With the same characters as *Divisa* on the hind wings.

(bb) Ab. ♀ *Internodimidiata*, Verity. The lemon blotches confined to the inner margin of the band on the hind wings.

(cc) Ab. ♀ *Semiobsoleta*, Rocci (1920). Blotches on the marginal band of the hind wings completely wanting.

(dd) Ab. ♀ *Seriata*, Rocci (1920). A form of the type having the series of the small ferruginous spots on the under side of the hind wings, usually absent, complete. The series is normally complete in *gen. vern.* and *gen. autumn.*

(ee) Ab. *Deannulata*, Rocci (1920). The small silver spot above the discoidal spot on the under-side hind-wings absent. The double silvered spots detached on the ground-colour.

(ff) Ab. *Bimaculata*, Verity. As in (ee), but on the upper side of the hind wings.

(gg) Ab. *Ægra*, Verity. Underside of the fore wings irregularly spotted with pale black. On the upper side also in the discal area. A pathological example.

(D) Chiefly Variation of Size.

(hh) Ab. *Minor*, Failla (1889) (= ? var. *Pyrenaica*, Gr. Gr.). I have already discussed this so-called aberration in its relation to *Vernalis*. A small form is constant in both sexes in the *gen. vern.* of the South of France, and is not uncommon in November emergences when they occur in Britain. Fitch figures in colour (*loc. cit.*) a female of what he calls the third brood, and gives in the text a woodcut of a male with much contracted hind wings. Unless ab. *Minor* is to be applied to all diminutive examples of whatever generation—and I suppose the author so intended—it is somewhat difficult to separate this form from the following:

(ii) Var. *Pyrenaica*, Gr. Gr. ('Horæ Soc. Russ.', 1893, p. 383). This is described as follows:

"Varietas fere duplo minor. Alis ♂ pallidioribus, posticis in disco cinereo-sparsis; ♀ alis anticis ex flavido-rutilis, posticis griseis, leviter aurantiaco-pulverulentis; maculis flavescētibz in limbo externo positis subnullis. Volat in alpinis Pyrenaicis."

If identical, therefore, with ab. *Minor*, *Pyrenaica* falls to it.

But I think the name may be retained. In the Pyrénées-Orientales de Graslin found this form at Collioure, pale yellow, the colour of Stephens's *Chrysotheme* (= *Helicina*), while at the other end of the chain a very small form is reported constant in the foot-hills of the Basses-Pyrénées ('Cat. Lépid. Basses-Pyrs.,' M. Larralde, 1895).

(jj) *Ab. Ampla*, Verity (1919). The author says that in Sicily a distinct race of *Edusa* occurs; it is also the finest on account of its large size and very bright colouring; in a series of the second generation from San Martino (May 15th-30th) the largest males reach 49 mm.

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 161.)

Ab. asperana, Schiff.

Schiffermüller's name raises an extremely difficult and obscure question. It is, of course, well known that his descriptions are so fragmentary and insufficient, that in those in which there is an absence of confirmatory evidence of their meaning by other writers who had seen the actual specimens they were made from in his collections, they are usually dropped; fortunately his collection of micros, some years after his death, was carefully gone through by two independent witnesses—Charpentier and Zincken—who compared his actual specimens with the figures of Hübner and left the record of their work in 'Die Zinsler, Wickler, Schaben und Geistchen.' Unfortunately Schiffermüller described some of his species from specimens in other collections than his own, and did not possess a type. *Asperana* was one of these, and he says of it—"in the collection of M. P." Now who "M. P." was is not certain. He was, however, a well-known Lepidopterist, judging from the fact that Schiffermüller described about twenty species from his collection. I have not much doubt, however, that these initials represent those of Matthias Piller, a Hungarian Jesuit. Schiffermüller named *Pilleriana* from specimens in the collection of "M. P." (see s.v., p. 126, No. 2). Fabricius ('Ent. Syst.,' tom. iii, par. ii, p. 252) writes of *Pilleriana* that it "was named after Piller, a Hungarian Jesuit." Hagen, vol. ii, p. 46, writes of Matthias Piller as the author of a work on entomology in 1782-3, or a few years after the date of Schiffermüller's book.*

* Since the above was written I find in the 'Accentuated List of British Lepidoptera,' published in 1858, p. 61, "*pilleriana*, named in honour of Piller, one of the Theresian Professors at Vienna." Evidently Piller was a close friend of Schiffermüller.

When Charpentier came to overhaul the collection after Schiffermüller's death he evidently did not know who "M. P." was, for he uses the initials in writing of them, and not the full name. It is to be inferred from this that the whereabouts of "M. P.'s" specimens when they could have been compared with Hübner's figures was not known, and we are thus reduced to the original description.

Schiffermüller arranged his Tortrices in groups according to colour, and *asperana* is put amongst those which are "cinereæ," which I take it from the species included would mean grey or brownish grey. His description of *asperana* is "grey, with variegated roughened wings," that is all!

Schiffermüller may have described a form of *literana*; on the other hand his specimen may have been some other species which was grey and had roughened wings, such as a form of *Peronea hastiana*, *P. sponsana*, or *P. niveana*. The only grey examples I have seen are four in the collection of Mr. R. South; but Barrett writes ('Brit. Lep.,' x, p. 217) of one taken in Suffolk at Bungay by a lady, "grey white with the usual abundant black dotting, but no trace whatever of green."

Certain writers deal with ab. *asperana*, and I give the citations for what they may be worth, which, I fear, is very little: Charpentier, 'Zins. Wick.,' p. 74 (1821); Hübner, 'Verz.,' p. 386, No. 3747 (1826); 'Treitsche,' viii, p. 166 (1835); Frey, 'Lep. Schweiz.,' p. 284 (1880); Snellen, 'Vlinders,' viii, p. 185 (1882); Kennel, 'Pal. Tort.,' p. 83 (1908); Wagner, 'Lep. Cat.,' par. x, p. 69 (1912).

Hübner in 'Verz.' (1826) says *Treueriana* (= *niveana*) and *asperana*, Schiff. = *squamalana*, Hüb., 'Tort.,' 93, 94 and 95, but in his copy of 'Schiffermüller,' now in the Walsingham Library—in which in his own handwriting is placed opposite all the species he figures in his work the numbers of each figure—*asperana* is without a number.

Herrich Schäffer says of *asperana* in 'Schmett v. Eur.,' p. 152: "There is a good specimen in Schiffermüller's Collection which resembles Hübner's fig. 94," but this figure is not pure grey, but has bright green mixed with the grey. As there was no specimen when Charpentier saw the collection in 1821 it is evident it was placed there after that date.

Herrich Schäffer figures two grey forms as *asperana* ('Tort.,' pl. i, figs. 2 and 3). Fig. 2 represents a form with a number of black markings; fig. 3 a grey form, apart from colour identical with ab. *squamana*, Fab.

Ab. *flavana*, n. ab.

I give this name to a form with the ground-colour of the superiors brownish buff. It has certain of the black dots that are common to so many of the *literana* forms, and, except for the

buff ground-colour of the superiors, it resembles in all respects *ab. squamulana*, Fab.

The only specimen I have seen of this aberration is one which came from the New Forest during September, 1919, but Kennel, 'Pal. Tort.,' taf. v, fig. 4, figures a very similar but slightly browner form, which he incorrectly terms *irrorana*, Hüb., from "Schilka, Collection Grand Duke Nikolai Mikhailovitch."

Ab. irrorana, Hüb. (Plate I, fig. 8.)

Synonymy.—*Irrorana*, Hüb., Tort., fig. 96 (1797); Hüb., Verz., p. 386, No. 3751 (1826); Curtis, Guide, p. 173 (1829); Stephens, Cat., p. 188, No. 7097 (1829); Rennie, Conspect., p. 180 (1832); Curtis, Brit. Ent., pl. 440, and No. 4 (1833); Stephens, Haust., iv, p. 165 (1834); Wood, Ind. Ent., fig. 1100 (1839); Westwood, Brit. Moths, pl. 96, fig. 12, and p. 164 (1845); Staudinger, Cat. Lep. Eur., p. 94 (1861), and p. 234 (1871); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176 (1882); Spuler, Schmett. Eur., p. 242 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Hübner's fig. 96 is unmistakable, but there is no description. The figure shows the superiors with greyish-green ground-colour thickly sprinkled with intensely black dots. It has the usual transverse lines, which are generally not apparent in British examples, or that are only faintly indicated in a few instances. *Ab. irrorana* is perhaps the most beautiful of all the *literana* forms, the black dots on the light green ground showing up very prominently, and contrasting exquisitely with them. It is well figured also by Curtis and Wood. The former's figure, which is slightly enlarged, is the best of all. Both these authors, of course, depict the English form.

Irrorana is not by any means an abundant form; it occurs in most of the localities in which the species is found. I have eight examples from the New Forest.

Ab. squamulana, Hüb. (Plate I, fig. 9.)

Synonymy.—*Squamulana*, Hüb., Vogel, fig. 14 (1793); Hüb., Tort., fig. 95 (1796); Hüb., Verz., p. 386, No. 3749 (1826); Frey, Lep. Schweiz., p. 284 (1880); Snellen, Vlinders, p. 176, No. 11 (1882); Wagner, Lep. Cat., par. x, p. 69 (1912).

Hübner, of course, does not describe this aberration; his figs. 14, 'Vogel,' and 95, 'Tort.,' are identical, except that in the former the disc of the superiors is greyish, whilst in 'Tort.' it is dark sage-green. In 'Tort.' he names figs. 92, 93, 94 and 95 as *squamulana*, but only the last figure agrees with his figure in 'Vogel.' Fig. 92 is what he subsequently in 'Verz.' named *aerugana*. In this work he retains the name *squamulana* for the other three figures. These three figures represent forms about

as wide apart as this species can produce; thus fig. 93 represents a form I have never seen, which has the superiors almost white crossed with very strong wavy transverse bands; fig. 94 is an extreme form of what I call *ab. mixtana*.

Ab. squamulana is evidently a very rare form. The only British example I have seen is a very beautiful one from the New Forest in the collection of Mr. South, which is given in fig. 9 of the plate. It agrees well with Hübner's figure, 'Tort.,' 95, except that it has the ferruginous patch which is missing in that figure but is found in 'Vogel,' fig. 14.

Hübner's fig. 14, 'Vogel,' I describe: Superiors greyish brown with a series of short black lines on the costa and on the hind half of the inner margin; at the base of the inner margin there is a ferruginous patch, which is not apparent in 'Tort.,' fig. 95, but in this figure there are some of the black longitudinal lines that are found in the figure in 'Vogel.'

(To be continued.)

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 172.)

Colaspis fuscipes, sp. nov.

Small. Bright rufous; eyes black, jaws, antennæ and legs almost entirely dark fuscous; thorax densely punctured except the discal base; sides strongly unidentate at the middle. Elytra strongly transversely depressed; the base and sides longitudinally ridged, and with raised rugosities; the lateral ridge or costa well defined nearly to the apex; on the remaining surface the punctuation is lineate, with rather raised interspaces, becoming costate at the apex.

Type, ♀, San Augustin, Mapiri, 3500 ft., September, 1895 (Stuart).

Length, 3.5 mm.

Head smooth, convex, only slightly depressed between the eyes, punctate; thorax slightly collared anteriorly, thickly and quite evenly punctate; basal ridges of the elytra are best seen by looking squarely from behind parallel with the top of the elytra, when they appear separate and plain, being broken by the basal depression, on the side becoming broken into separate tubercles, and the disc lineate punctures. The ♂, which is unknown, is probably without tubercles or costæ.

Colaspis obliqua, sp. nov.

Small; elongate parallel. Body below light brown with aneous lustre; tip of abdomen rufous; above, bright brown with a distinct

bronze colour, the latter predominating on the head and thorax, the former more in evidence on the elytra; all the margins more or less distinctly cyaneous; an ill-defined but at the same time noticeable wheal or ridge from the shoulder diagonally to the apex, and especially appearing just behind the middle of the elytra; entire upper surface thickly punctate, mostly confluent, forming transverse rugæ.

Types, two ♂, two ♀, Cochabamba, Boliv. (Germ.).

Length, 3 mm.

Head thickly punctate, with a well-marked depression and longitudinal groove; antennæ rufous, last joints partly darkened; thorax slightly collared, thickly and evenly punctate, with a few smooth areas. Sides angulate back of the middle. Elytra only slightly depressed within the shoulder, densely geminate, punctate in the disc, confluent and transversely rugose at base and sides, and deeply striate punctate at the apex; the diagonal wheal forms a somewhat smooth, narrow space, the rear end of which becomes the third interspace. The elytra of the ♀ are a little more costate as to the intervals, but the diagonal is about the same in the sexes; the apices of the tibia and tarsi are more or less fuscous. Related by its shape to *foveolata*, Lef.

Colaspis bidenticollis, sp. nov.

Very small; short and stout. Metallic, cyaneous green, shining; labrum, antennæ and legs flavous; thorax thickly and finely punctured, sides bidentate at and before the middle; elytra obsoletely transversely depressed, very finely, seriatly, semi-geminately punctate, costate and lineate, punctured at the apex; surface semi-alutaceous.

Type, ♂, Rio Tucuman, Argentina (Bruch) (second Jac. Coll.).

Length, 2.5 mm.

The size of a small *C. pusilla*, Lef., head wide, front almost flat, thickly evenly punctate, thorax feebly impressed either side back of the middle; form quadrate, not much narrowed in front; the apex of the elytra has a rather noticeable depression which produces a semi-tubercle effect. The antennæ reach just below the shoulder and have the last five joints more or less thickened (like *Nodonota*); the legs also seem thickened and the prosternum is flattened. As Mr. Jacoby remarks in his description of *Alethaxius angulicollis* ('Trans. Ent. Soc.,' 1900, p. 490), this and the two following species are forms for which it is difficult to find the proper place, and do not quite agree either with *Colaspis* or *Alethaxius*.

Colaspis denticollis, sp. nov.

Very small, stout. Body below æneous bronze; above, head, thorax and scutellum cyaneous blue; elytra violet purple, very

narrowly edged with cyaneous; labrum, antennæ and feet wholly rufous; the legs robust and short.

Type, 1 ♂, Tucuman, Argentina.

Length, 2.5 mm.

Antennæ reaching nearly the middle of the elytra; last five joints much thickened (like *Nodonota*); head thickly punctate, opaque; thorax with anterior angles very prominent, sides strongly and sharply unidentate at the middle, scutellum smooth, elytra somewhat impressed within the shoulder, widening into a faint transverse depression, the surface very finely semi-seriate punctate, much plainer at the apex and sides, where the intervals are somewhat raised.

Mr. Jacoby's remarks referred to in my description of *bidenticollis* apply also to this species.

Colaspis æneus, sp. nov.

Very small; short, parallel. Above and below æneous bronze, shining; feet, antennæ and mouth parts entirely fulvous; head and thorax thinly, finely and evenly punctulate, sides strongly angulate at the middle; elytra finely semi-geminate punctate striate, costulate at the apex, the surface very finely alutaceous.

Type, 1 ♂, Tucuman, Argentina (Baer).

Length, $2\frac{1}{2}$ mm.

Head with usual cross depression, and a well-defined fovea at the vertex; antennæ with last five or six joints much thickened (like *Nodonata*); thorax very lightly collared and with a slight fovea on either side behind; anterior angles prominent. Elytra somewhat impressed within the shoulder, widening into a faint transverse depression (like *denticollis*), and, like that species, an aberrant form.

Hermesia, Lef.

This genus of Lefevre's was founded for *C. aurata*, Oliv., a well-defined form from Cayenne, in which the hind tibia of the ♂ is strongly angulate within, at nearly the middle; body above brilliant metallic golden or coppery green. Mr. Jacoby joins with this species certain forms from Bugaba and Chiriqui. My four examples from these places include three of those referred to by Jacoby, and they are all ♀'s. He also includes three specimens from Chontales described as *Rhabdophorus violaceus*, one of them said to be a ♂; the other two examples are before me and are ♀'s, ? as to the ♂. What is probably another species, and at present lumped with *aurata*, is the Bolivian form, either green or cyaneous blue, but in which the dilation of the hind ♂ tibia seems much less developed, but more ♂'s of *aurata* from Cayenne should be in hand before separation.

Hermesia cyanea, sp. nov.

Form and size of a small *aurata*. Below and legs cyaneous bluish, above shining metallic, cyaneous green; thorax minutely and on the disc remotely punctulate; elytra strongly transversely depressed, and closely punctate striate, becoming very fine at tip.

Hind tibia of ♂ dilated within, half-way between the apex and middle, very much nearer the apex than in *aurata*.

Type, 1 ♂, St. Catharina, Brazil; also 1 ♂, 2 ♀, Amaz. Vall., near Santarem.

Length, 5 mm.

Very close to *aurata*, Oliv., but the ♂ easily separated by the difference in the hind tibia, *aurata* having the angulation median, this species much nearer the apex. The antennæ are fuscous with rufous base, and metallic colouring on the scape; head very sparsely and finely punctate, like *aurata*; in fact all the punctuation is very like that species, but in the ♀ *cyanea* the sides of the thorax are more distinctly angled behind the middle.

Hermesia ænea, Jac., seems to depart from the rest of the genus in the form of the thorax, being analogous to that group of the genus *Rhabdopterus* represented by *erosulus*, Lef., i.e. thorax widened near the base, as cited by Mr. Jacoby ('Trans. Ent. Soc.,' 1900, p. 173).

Hermesia Jacobyi, sp. nov.

Size of *aurata*. Uniformly brown, like *brunnea*, but a little brighter; thorax broad, sides strongly unidentate at the middle, with a well-marked sinuation in either side of the tooth; sparsely punctate, though somewhat segregated into groups, leaving smooth areas; elytra semicircularly depressed at the shoulder, strongly and closely seriate punctate, somewhat fainter, and with slightly raised intervals at apex.

Type, ♂, Peru (Marcâpata?) (second Jac. Coll.).

Length, 6.5 mm.

Front with well-marked transverse depression; antennal joints 8 to 11 missing, third slightly shorter than fourth; thorax with rear edge strongly sinuate at middle. One of the largest smooth areas (irregular) is on the disc. Scutellum smooth impunctate, elytra parallel, punctuation nearly uniform; first tarsal joint of the anterior and middle legs very fully dilated. Easily separated by its thoracic characteristics.

Hermesia similis, sp. nov.

Short and robust. Body below black, slightly tinged with green, labrum, antennæ and legs rufous; above metallic green, cyaneous; thorax thickly and at sides confluent punctate; elytra closely and strongly punctured, seriate at the base and middle, finely punctured striate at apex.

Type, 2 ♂, 2 ♀, Cochabamba, Boliv. (Germ.),

Length, 4 mm.

Head thickly punctured, with rather a prominent frontal depression and transverse groove; thoracic margin not very wide, faintly sinuate angulate at the middle; punctures fine and large, mixed, crowded, with the not uncommon smooth area at the middle base; elytra with well-marked basal and cross depressions. Form rather stout and convex, like *lampros*, Jac., but colour green in place of coppery and general form not so large.

Hermesia confusa, sp. nov.

Nearly the size, shape and colour, *i. e.* fulvous brown, as *brunnea*, Jac., with a tendency in some examples for the elytra and legs to become piceous or purplish; thorax scarcely subangulate at the sides, and finely punctured (both like *brunnea*); elytra geminate punctate, nearly obsolete at the apex, the intervals in the ♀ plainly marked with smooth, slightly elevated lines, less noticeable in the ♂.

Type, 4 ♂, 3 ♀, Mineiro, Goyaz, Brazil.

Length, 5-6 mm.

A specimen of *brunnea*, Jac., ♀, from Jacoby's collection, and probably one of the three examples referred to in his description ('Trans. Ent. Soc.,' 1900, p. 489), is before me; the main difference between *brunnea* and *confusa* is the elytral punctuation; it is very much stronger and thicker in *brunnea*, and without the geminate, costate arrangement of *confusa*; the apical punctuation is much stronger in *brunnea*. The geminate character of the punctures varies somewhat in different examples, and sometimes the series may be three punctures in place of two.

Hermesia inermis, sp. nov.

Similar to a small *aurata*, Oliv., but entirely dark violet, with the base of antennæ and labrum rufous; thorax finely punctate; elytra finely punctate striate, with smooth intervals at apex; hind tibia of ♂ without any dilation, such as is present in *aurata*.

Type, ♂, ♀, Columbia (Pelke) (unnamed in Jac. Coll.).

Length, 4-5 mm.

Head, especially the epistome, rather coarsely punctured, with a deep transverse depression; scape of antennæ partly cyaneous; thorax transverse, margined and subangulate behind the middle; most of the punctures very fine, but here and there a coarser cluster, especially at the sides. Elytra with short and deep basal depression, showing coarser punctures. Closely allied to *aurata* and *cyanea*, but easily separated by the simple hind tibia of the ♂.

Agbalus, Chap.

This genus is founded upon *A. sericeus*, Chap., which is finely pubescent, with short antennæ and legs, and the ♂ with a strong spur on the hind tibia; Lefevre added various non-pubescent forms with slender legs and long antennæ, and Jacoby added *puncticollis* and *tenebrosus* from Mexico without the tibial spur. Now occurs an intermediate form with dilated tibia.

Agbalus dilatipes, sp. nov.

Medium sized, ovate. Dark chestnut brown, æneous shining; the margins and elytral punctures faintly metallic green; the breast also dark green æneous; legs short and stout, the hind tibia of the ♂ sharply angulate within at the posterior third, the angulation furnished with long yellow hair.

Type, 2 ♂, 1 ♀, Paraguay (Dr. Bohis).

Length, 4 mm.

Form convex, front with a small fovea, or subsulcate, the transverse depression feeble; punctuation fine, sparse on the vertex; thoracic punctuation excessively fine and even, slightly thicker and coarser at the sides; elytra closely punctate, arranged in striate form, coarser at the sides, and finer at the apex, and with slightly costate intervals, especially in the ♀; transverse depression feeble.

The dilation of the ♂ tibia causes the apex beyond the angle to appear emarginate.

If I am correct in my identification of *Colaspis humeralis*, Baly, it occurs from St. Catharina, Brazil, running from the form having red humeral spots to uniform coloured elytra. The descriptions seem to agree perfectly, but the species seem much more naturally placed in *Agbalus* than *Colaspis*, coming next *Agbalus plagiatus*, Lef.

(To be continued.)

NOTES AND OBSERVATIONS.

WE hear that Esher Common (or Claremont Woods), which naturalists of west and south London know so well, may possibly be turned into golf-links. The Esher and Dittons Urban District Council has been approached by a syndicate for this purpose. If this comes about the value of the common as a lung of west and south London will be removed, and the very interesting and characteristic fauna and flora will be destroyed. Having regard to the present need of producing timber, the common should surely be allowed to reafforest itself, which it has already begun to do.

POLYGONIA C-ALBUM ON THE COTSWOLDS.—It may be of interest to record that on July 4th I saw a fine, dark example of *P. c-album* at Owlpen, near Nailsworth, on the Cotswold Hills.—B. A. CONEY; Pucklechurch, Gloucestershire.

EREBIA EPIPHRON IN 1921.—On June 27th in a certain favoured spot very high up in Cumberland, I saw *Epiphron* flying in hundreds, but already in well-worn condition. Eight days before I was on Helvellyn and on the look-out for them, but did not see a single example.—B. A. CONEY; Pucklechurch, Gloucestershire.

EARLY AND LATE OCCURRENCES OF HESPERIA MALVÆ.—In reply to Mr. Jaques' inquiry in the June 'Entomologist,' I may say that, although I have recorded earliest dates for *H. malvæ* for thirty-two years, there is among them none earlier than May 5th, 1906. But

this, I think, is owing to the fact that in 1893 I was living in a part of Lincolnshire in which I never found the species. In that wonderfully early year, greatly resembling in this respect the present year of grace, there may be found on p. 247 of vol. i of Tutt's 'British Butterflies' no fewer than fifteen records of this species occurring in April, the three earliest being April 7th at Hereford, April 9th at Eynsford and April 10th at Stroud, all these being earlier than Mr. Jaques' date of April 12th. This spring I was unable to visit the haunts of *malva*, a few fields away from here, till May 13th, when I saw several specimens on the wing, but I am taking it for granted that it was out in April, and therefore that a freshly emerged male I took yesterday (June 28th, 1921) almost certainly belonged to a second brood. The locality is a hot grassy field, surrounded on three sides by a wood, and I cannot conceive that a hibernated pupa failed to emerge during the glorious weather we had in April and in May. Among Tutt's records *in loco citato* I find July 16th, 1905, at Shepton Mallet. This is probably also a second emergence, as the species was out early in this year also, viz. on May 9th here at Hazeleigh, and in April near Wendover. Against my argument, however, are two late dates in such a backward year as 1902, when Burrows took it at Chattenden on July 16th, and Whittle found it at Thundersley on August 2nd—probably the only August date ever recorded in Great Britain.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex.

OVIPOSITING OF *SESIA MYOPÆFORMIS*.—I was interested to see a ♀ *S. myopæformis* depositing ova on July 2nd last in a very hot sun. The insect hovered in front of the apple-trunk in circles, with wings vibrating almost like a burnet. Once a suitable position was found the insect alighted, curving its abdomen, with the anal tuft fanned out, and, so far as I could ascertain, the ova were deposited at the back of loose pieces of bark. The whole operation took about three seconds, the wood selected being the almost dead wood adjoining the living.—G. BERTRAM KERSHAW, M.Inst.C.E.; West Wickham, Kent.

OXIGRAPHA LITERANA, L., IN LANCASHIRE.—I took a specimen of this moth off a silver birch trunk in Eggerslack Wood, Grange-over-Sands, on April 25th, 1920. It is type form, resembling fig. 1 of Plate I in the June 'Entomologist.' There appear to be few or perhaps no previous Lancashire records.—J. DAVIS WARD; Limehouse, Grange-over-Sands.

ERRATIC EMERGENCES.—On June 27th a specimen of *Tæniocampa mimosa* emerged in my pupæ-cage, the rest of the brood having come out normally in early April. I have now a further lot of pupæ of the same species from larvæ which my children beat at Arnside on May 16th. These went down about June 7th, ten days earlier than those I had last year, to which the above belated specimen belongs. *Nemeobius lucina*, bred from the egg last summer, and kept during the winter in my sitting-room, began to emerge in January, and dribbled out, one or two each week, till the last, which appeared yesterday, June 26th, a full month after the wild ones were flying. This species is spreading rapidly in Westmorland. My friends all tell me that Lepidoptera are scarce this season here, though the early part of the

year seemed encouraging. The weather since May has been dry with persistent north-east winds, but we have had nothing like the extreme drought reported for the south-eastern counties.—FRANK LITTLEWOOD; Kendal, Westmorland.

[Writing on July 15th, and referring to *N. lucina*, Mr. Littlewood remarks: "To-day another specimen (♀) has emerged in my pupæ-cage."]

BUTTERFLIES IN WEST SUSSEX.—The hibernating species have been comparatively scarce this season, and for the first time in five years *Eugonia polychloros* has not been observed. *Pieris rapæ* was first seen on March 27th, *Euchloë cardamines* on April 2nd, *Cyaniris argiolus* and *Pararge egerides* on April 12th. Then followed nearly a fortnight of cold weather during which nothing was seen. *Pieris brassicæ* appeared on April 28th, and on April 29th, a beautifully warm day, *Pieris napi* was seen. *Brenthis euphrosyne*, two seen, one taken, and *Callophrys rubi* taken. April 30th *Hesperia malva* and *Thanaos tages* were sought for and seen. On May 9th a single male *Leptosia sinapis* was taken in a locality from which, so far as I know, its occurrence has not been previously recorded, proving that the species is not yet quite extinct in West Sussex. *Pararge megera* was seen on the same date, and on May 10th *Cænonympha pamphilus*. *Lycæna icarus* was seen on May 16th, and the last of the first brood of *P. egerides* was seen on May 17th. *Nemobius lucina* was fully out on May 19th, *Brenthis selene* on May 25th, and on May 27th *Lycæna bellargus*. On June 2nd the second brood of *P. egerides* was on the wing. On June 10th *Epinephile jurtina* appeared, and the moths of *Tortrix viridana* were flying four or five days earlier than last year. The plague of these has not been so bad this season as during the three previous years. On June 13th *Augiades sylvanus* was seen. On June 17th two *Euchloë cardamines* seen—a very late date. On June 23rd *Limenitis sibylla* was fresh out, and on June 24th *Argynnis paphia*.—CHARLES M. WOODFORD; The Grinstead, Partridge Green, Sussex.

SYMPETRUM FONSCOLOMBII, DE SELYS, IN DORSET.—That other observers may be on the alert, it may be well to record at once the re-appearance of *Sympetrum fonscolombii*, de Selys, to my great satisfaction, on the more eastward of the two ponds in this neighbourhood, where the species appeared in July, 1912, 1913 and 1914, but from which it had, perhaps rather doubtfully, seemed entirely absent since. My watch may have become rather perfunctory for the last two or three seasons, and the days possible for observation sometimes turned out not too good for dragon-flies in certain of the six barren years. Yet the first insect, seen on my arrival on the 11th inst., was unmistakable, and I found a sprinkling of males all around the pond, while I followed up over the heath, but unfortunately lost sight of, what looked like a very teneral, glossy-winged female. I took one male so as to have tangible evidence of its presence. On July 13th I again found the same sprinkling of males, and took one female. On July 12th I visited the other, more westward pond, in further search, but found it reduced to hardly more than a puddle, and, of course, no trace of the dragon-fly present. The constancy of the

July date of appearance seems to me to have great significance, and also the fact that no other heathland ponds save the two mentioned, either in this or in previous years, have produced the insect—a further surely most significant coincidence. The weather has, of course, been ideal.—F. H. HAINES; Brookside, Winfrith, Dorset, July 14th, 1921.

BLOOD-SUCKING THYSANOPTERA.—In corroboration of Mr. C. B. Williams' note in the July number of this Journal (p. 163), I may mention that I was bitten by small *Thysanoptera* on several occasions during my residence in Ceylon. On feeling a small but sharp prick one would find the little creature puncturing the skin of the wrist or face, but I never allowed one of them to remain long enough to distend itself with blood, as described by Mr. Williams. I believe that it is recognised that certain species of *Thrips* are predatory upon other small insects. I have found them, for instance, occupying the tunnels of Scolytid beetles, where they were almost certainly preying upon the larvæ of the borers. I think it is doubtful, however, if any *Thysanoptera* habitually suck the blood of warm-blooded animals. I always regarded such occurrences as in the nature of an experiment on the part of the insect, which, finding itself accidentally settled on a soft body, automatically sampled the contents. It is conceivable, however, that from such small beginnings might be evolved an habitually blood-sucking race of *Thrips*.—E. ERNEST GREEN; Camberley.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*April 6th, 1921.*—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., in the Chair.—The following were elected Fellows: Miss J. Riddell, Los Angeles, California, U.S.A.; Mr. C. Dover, The Indian Museum, Calcutta, India; Mr. D. J. Atkinson, Broadoak House, Newnham, Gloucestershire; Mr. L. B. Hopper, Manor House, Penryn, Cornwall; Mr. F. H. Lancum, Fernside, Shepherd's Lane, Dartford; Mr. F. D. Coote, 11, Pendle Road, Streatham, S.W.; Mr. H. E. Box, 151, Stamford Hill, N. 16; Mr. H. M. Sims, B.Sc., The Farlands, Stourbridge; Mr. H. H. Wallis, M.A., 145, Wilmer Road, Heaton Road, Bradford; Mr. F. Rhodes, 113, Park Row, Heaton Road, Bradford; and The Rev. G. Watkinson, M.A., Woodfield, Hipperholme, Near Halifax.—Mr. E. E. Green, remarking on the early appearance of Lepidoptera this season, stated that an example of *Xanthorhœ fluctuata* had come to light on March 12th, while in regard to the hibernation of *Pyrameis atalanta* in Britain—a still debated question—he had observed a specimen at sallow on March 17th at Camberley.—Mr. C. B. Williams exhibited a case of insects from tropical America, including a *Monadela* species of wasp which buzzed only when digging and spreading mud, and examples of insects distinctive to sugar-cane.—Lt-Col. H. D. Peile, a number of interesting Lepidoptera (*Rhopalocera*) taken on the N.W. frontier of India and in N.W. Persia, including a gynandromorphous specimen of *Colias glicia*, and a series of

Zephyrus quercus mesopotamica of large size and brilliant purple colouring.—Mr. J. H. Durrant, a series of *Blastobasis lignea*, Wlsm., including var. *adjustella*, Wlsm., captured in Lancashire, a member of the *Blastobasidae*, a family not hitherto taken in Britain.—The Rev. J. Waterston, examples of *Apanteles americanus*, Lepeletier, and its hyperparasite *Ilorismentus nigro ceneus*, Ashmead.—The President said he suspected that the host on which this *Apanteles* was parasitic was *Phlegethontius rustica*.—The following papers were read: Mr. A. M. Lea, "On some *Chrysomelidae* (Coleoptera) in the British Museum," and Mr. K. G. Blair, "Types of *Heteromera*, described by J. Walker in the British Museum."—The President announced that the Library was now available for lending books to Fellows, and after a discussion it was resolved unanimously that the Society's new rooms at 41, Queen's Gate, S.W., should be opened from 5 p.m. to 10 p.m. on the third Wednesdays in the months of February, April, May and June, for an informal meeting of Fellows and their friends.—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*April 14th*.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Miss L. E. Cheeseman read a short paper on "The Parasite of *Sirex gigas*: *Rhyssa persuasoria*," (Hym.) and illustrated it with lantern-slides. Mr. Edwards exhibited the parasite from both Britain and the Continent.—Mr. H. Main, larvæ of *Geotrupes*, sp. (Col.), and described their movements and economy.—Mr. Newman reported *Triphæna pronuba* at sallow March 9th, *Callophrys rubi* on April 10th, and the early abundance of *Euchloë cardamines*.—Mr. Blair, living larvæ of *Photuris pennsylvanica*, a fire-fly of the Eastern United States.—Mr. Main, for Mr. Enifer, larvæ of the red mite, *Trombidium*, common in gardens, and remarked on its polyphagous habits.—Mr. Bunnett, *Callidium variabile* (Col.), bred from an oak plank.

April 28th.—The President in the Chair.—Mr. H. L. Dalton, of Reading, was elected a member.—The Rev. J. Waterston, B.D., B.Sc., gave an address, "The Natural History of Macedonia," illustrated with lantern-slides, and a large number of insects other than Lepidoptera by himself and Mr. K. G. Blair, with additional slides by Dr. Forbes and colour sketches of the scenery by Major Cottam.—Mr. Blair exhibited a collection of Lepidoptera sent by Mr. G. B. Pearson from California, and also living examples of the Coccid *Phenacorus aceris*, on Spanish chestnut and beech at Oxshott.

May 12th.—Mr. Stanley Edwards, F.L.S., F.Z.S., Vice-President, in the Chair.—Mr. L. N. Stoniland, of Muswell Hill, was elected a member.—*Exhibition of "other orders."*—Prof. T. D. A. Cockerell exhibited numerous fossil insects from the Mid-Tertiary strata of the Isle of Wight with drawings of new species.—Mr. Lyle, a skein of silk wound from two cocoons of *Meteorus albiditarsis*, a hymenopterous parasite on *Bupalus piniperda*.—Mr. Step, nests of *Sceliphron*, sp., the mud-dauber wasp from Calcutta.—Mr. S. R. Ashby, the collection of British earwigs, cockroaches, grasshoppers, locusts and crickets formed by the late Curator, Mr. W. West.—Mr. Withycombe, *Scorpio europæ*, the young stage of *Mantis religiosa*, etc., received from Mr. Hugh Main in the South of France, and also

Sinodendron cylindricum (Col.) from a decaying beech in Epping Forest.—Mr. H. Moore, an exotic Homopteron, *Ptyelus flavescens*, from Nairobi, and also a specimen of *Gongylus gongyloides* from Ceylon.—Mr. O. R. Goodman, *Timarcha lævigata* (Col.), abundant at Horsley on May 8th.—Mr. B. S. Williams, *Orchestes salicis* (Col.), from willow at Finchley.—Mr. Coxhead, sketches of galls and their makers.—Mr. Turner, specimens of one of the largest dragon-flies, *Mecistogaster cæruleata*, from Central America.—Mr. Edwards, a collection of Central European Hymenoptera and Diptera.

May 26th.—Mr. Stanley Edwards, F.L.S., Vice-President, in the Chair.—Mr. G. T. Lyle, F.E.S., of Wallington, was elected a member.—Mr. Farmer exhibited a partly xanthic *Rumicia phlæas* and a similarly coloured *Callophrys rubi*, both from Riddlesdown.—Mr. Neave, pupæ of *Strymon pruni* from N. Huntingdon.—Mr. Simms, ova of *Cupido minimus* and the beetle *Cryptocephalus aureola* from Eastbourne.—Mr. Goodman, suffused forms of *Ematurga atomaria* from St. Martha's Hill, Guildford.—Mr. Bunnett, the beetle *Hedobia imperialis* taken at Coulsdon.—In remarks on the season it was noted that *R. phlæas* was very common, *Celastrina argiolus* was very scarce, and that *Eulype hastata* and *Hemaris fuciformis* were out at Horsley.

June 9th.—The President in the Chair.—Mr. A. A. W. Buckstone, series of *Colias croceus* (*edusa*) with extended black border of fore wings.—Dr. G. S. Robertson, ab. *cæca* of *Aphantopus hyperanthus* from the Lakes, forms of *Spilosoma menthastri* with spots tending to run together bred from Horsley, pale forms of *Tiliacea aurago* from Box Hill and dark ones from Torquay, and var. *lavatera* of *Hesperia malvæ* from Bude, etc.—Mr. K. G. Blair, living specimens of the Phasmid *Bacillus gallicus*, young larvæ of *Thais rumina* and *Papilio podalirius*, the asparagus beetle *Crioceris 12-punctata*, the pupæ of the glow-worm, and the females of *Epichnopteryx*, sp., on the life-history of which he communicated notes.—Mr. O. R. Goodman, the melanic form of *Hemerophila abruptaria* taken near its original locality in N. London.—Mr. F. B. Carr, larvæ of *Ptilophora plumigera*.—Mr. Enifer, cocoon and pupa of the ant-lion from S. France.—Mr. Grosvenor, a living specimen of *Trochilium crabroniformis* and a hybrid between *Zygæna trifolii* and *N. hippocrepidis*.

June 23rd.—The President in the Chair.—Exhibition of living objects.—Mr. H. Main, a number of objects obtained recently in S. France, including toads, crickets, centipedes, scorpions, spiders, trap-door spiders, earwigs, harvesting-ants, larvæ of the ant-lion, of the *Ascalaphus*, of *Palpares*, etc.—Mr. Coxhead, galls in ash leaves of the Dipteron *Perrisia fraxini*.—Mr. Blair, the Phasmid *Corausius morosus* from India, the glow-worm *Lampyrus lusitanica* from S. France, and the fire-fly *Photuris pennsylvanica* bred from larvæ from U.S.A.—Mr. H. Moore, dipterous parasites from a pupa of *Sphinx ligustri*.—Mr. Enifer, larvæ of *Coccinella bipunctata* and of an *Anthrænus* with the grain weevil *Calandra granaria*.—Mr. Withycombe, larvæ of the scorpion-fly, etc.—Mr. Carr, larvæ of *Bithys quercus*, *Xanthorhoë montanata*, *Tephrosia consonaria*, etc.—H. J. TURNER, Hon. Editor of Proceedings.

1990-1991

CONVINCING FOR CONVICTION

... ..

C. E. Newman

1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 26

HILL, BRONDES-

$$d' \approx 1,11.$$

d Zahl, *n* = 1, 2, 3, ...

the third Tuesday

REFS

5.

16/6.

to order:

1, 1981, 16, (11), 3 -

e. London, E.C. 1.

CONTENTS.

A New Species of Mayfly, *Palingenia* (*Sensu lato*), from Mesopotamia, *Kenneth J. Morton*, *F.E.S.*, 157. Some Undescribed Rhopalocera in the British Museum (Nat. Hist.), *N. D. Riley*, *F.E.S.*, *F.Z.S.*, 180. *Cobias edusa*, Fab. (*Crocus*, Fourc.). Its Seasonal Forms, Varieties and Aberrations, *H. Rowland-Brown*, *M. L.*, *F.E.S.*, continued from p. 157, 184. *Oxypoda literana*, L.: Its Life Cycle, Distribution, and Variation, *W. G. Sheldon*, *F.Z.S.*, *F.E.S.*, continued from p. 161, 187. South American Eumolpida. Mostly of the Group Colaspini, *David C. Béditch*, continued from p. 172, 190.

NOTES AND OBSERVATIONS. *Polygonia caubum* on the Cotswolds, *B. A. Coney*, 195. *Erebia epiphron* in 1921, *B. A. Coney*, 195. Early and late Occurrences of *Hesperia malve* (*Ram*) *Gilbert H. Raynor*, 195. Ovipositing of *Sesia myopiformis*, *G. Ertan*, *Kew Jarw.*, *M. Inst. C.E.*, 196. *Oxypoda literana*, L., in Lancashire, *J. Davis Ward*, 196. Erratic Emergences, *Frank Littlewood*, 196. Butterflies in West Sussex, *Charles M. Woodford*, 197. Symptetrism, *Totuscolombii*, de Selys, in Dorset, *P. H. Haines*, 197. Blood-sucking *Physanoptera*, *E. Ernest Green*, 198.

SOCIETIES. The Entomological Society of London, 198. The South London Entomological Society, 199.

CABINET WANTED.

State Particulars, Condition, and Price required.

F. STANLEY-SMITH, 13, The Knoll, Swindon, Wilts.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1911, 1s. each, double numbers, 2s. each. 1915 and 1916, 9d. each, double numbers, 1s. 6d. 1917 and 1918, 1s. 6d. each. Bound Volumes for 1890 to 1911 can be supplied (except 1910, Vol. 43) at 15s. each, 1915 and 1916 at 10s. 6d., 1918, 15s.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,

43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

SEPTEMBER, 1921.

No. 700

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S. W. J. LUCAS, B.A., F.E.S.
H. ROWLAND-BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.
W. L. DISTANT, F.E.S., &c. DR. D. SHARP, F.R.S., F.E.S., &c.
F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.
C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:
ADLARD & SON & WEST-NEWMAN, LTD.
BARTHOLOMEW CLOSE, E.C. 1.

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections. 200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper, 1,000 labels, **9/9**; 2,000, **12/9**; 3,000, **15/9**.

Locality and date only (2 lines), 1,000 labels, **9/6**; 2,000, **12/-**; 3,000, **15/-**.

FOR MICROLEPIDOPTERA, &c.

Printed in the *smallest type made* (2 lines), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*.

1,000 labels, **12/-**; 2,000, **15/-**; 3,000, **18/-**.

Locality and date only (2 lines), 1,000 labels, **10/6**; 2,000, **13/6**; 3,000, **16/6**.

For equal quantities of localities, etc., or each additional line, in either style of type, **1/6 extra**. Special workings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations  , 100, **1/6**; 300, **3/-**.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 4.

THE ENTOMOLOGIST.

VOL. LIV.]

SEPTEMBER, 1921.

[No. 700

PIERIS RAPÆ, GYNANDROUS AB.

By F. W. FROHAWK, F.E.S., M.B.O.U.

GYNANDROMORPHISM is of such exceedingly rare occurrence among the Pieridæ, especially as regards our three common species, *P. brassicæ*, *P. rapæ* and *P. napi*, that it is with pleasure I am able to give a figure of probably a unique gynandrous example of *P. rapæ*, now in the cabinet of Mr. Douglas C. Johnstone, to whom my thanks are due for the loan of the specimen for figuring. It was taken by the late Herbert Williams



on June 6th, 1891, at Boxhill, Surrey. As will be seen by the drawing, the left fore wing is wholly that of a normal male, and the costal areas of both the right fore and hind wings, as well as the costal spot on the latter, are of male colouring and marking; while the rest of the right wings and the whole of the left hind wing are of female colouring and markings. I know of no similar example of this species. The only gynandrous *P. brassicæ* known to me was a specimen taken many years ago by the late Mr. George Bryant, who sent it by post to the late Mr. Sidney Webb, but unfortunately it was smashed to fragments.

August, 1921.

NEW SPECIES OF NOCTUINÆ AND HYPENINÆ
FROM THE PHILIPPINES.

BY A. E. WILEMAN AND RICHARD SOUTH.

Eucampima griseisigna, sp. n.

♂. Head, thorax and abdomen sooty brown; antennæ bipectinated, except at apex. Fore wings sooty brown; subbasal line blackish, slightly curved; antemedial and postmedial lines blackish; both are elbowed below the costa, the latter outwardly edged by a white line, which is crenulate at and below the elbow; subterminal line not clearly defined, but indicated by whitish dots between the veins; a greyish mark, formed of three spots, on dorsal area between the ante- and post-medial lines. Hind wings sooty brown, with three darker transverse bands, the middle one edged by an undulated white line, the outer one edged by whitish points. Underside similar to above but rather browner; a black discal spot, edged with whitish on hind wing.

Expanse, 30 mm.

Two males from Palali, subprov. Benguet, Luzon (2000 ft.), December 25th and 26th, 1912.

Sypna brevicauda, sp. n.

♀. Head and thorax dark brown, with reddish tinge; abdomen ochreous brown, darker dorsally. Fore wings ochreous brown, finely mottled with darker and sprinkled with black scales; antemedial line dark brown, almost blackish, slightly crenulate and curved, the basal area enclosed dark brown; medial line dark brown, almost straight from costa to dorsum, the internal area up to antemedial paler brown; postmedial line dark, sinuous, interrupted and indistinct, originating on costa in a geminate mark; subterminal blackish, oblique from costa near apex to vein 5, thence wavy and excurved, terminating at tornus; terminal area brown, slightly suffused with violet; whitish dots on costa towards apex, and a pale cloud towards costal end of the sub-terminal; terminal dots black, edged with white; fringes dark brown, crenulate, a pale line at their base. Hind wings ochreous brown, a blackish band before termen, its outer edge limited by the blackish subterminal line, which is indented below middle; discoidal mark blackish, with a dusky shade from it to dorsum; terminal lunules black, not continued towards costa, those nearest anal angle outwardly edged with whitish; fringes brown, crenulate, produced at vein 4. Underside of fore wings ochreous, irrorated with blackish on costal and terminal areas; two, outwardly oblique, black transverse lines, neither reaching dorsum, and a black cloud on terminal area above tornus; of hind wings ochreous, irrorated with black and traversed by two black, transverse lines, the first line angled at middle and the other wavy; a blackish band beyond the second transverse line, outer edge indented below middle.

Expanse, 50-58 mm.

Two females from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), one on November 9th, the other on December 13th, 1912. Another specimen of the same sex was taken at Manila, prov. Rizal, Luzon (sea level), August 2nd, 1912.

The Manila specimen only differs from the others in having the central area of fore wings faintly suffused with violet. The December female has been described.

Trigonodesma bimacula, sp. n.

♀. Head and thorax grey, reddish tinged, abdomen brownish grey. Fore wings grey, with a reddish tinge, two conspicuous chocolate-coloured spots on costa, the first somewhat triangular about middle, the second smaller before apex; transverse lines very indistinct, the antemedial commencing in a chocolate dot on costa; a chocolate dot below the first costal spot; dusty lunules on termen, fringes pale ochreous at base. Hind wings fuscous brown, fringes paler, inclining to ochreous at base. Underside brownish grey, a dusky postmedial line on all wings and a black discal dot on hind wings.

Expanse, 36 mm.

A female from Baguio, subprov. Benguet, Luzon (5000 ft.), June 22nd, 1912.

Nagia subterminalis, sp. n.

♀. Head and thorax brown, mixed with darker; abdomen greyish. Fore wings brown, suffused with darker and mottled with black; sub-basal line pale brown, slightly oblique, edged with black; antemedial line black, wavy, edged with pale brown; postmedial line black, edged with pale brown, outwardly oblique to cell around which it curves, thence inwardly oblique to dorsum; subterminal line ochreous, indented below costa, inwardly edged with pale brown about middle and followed by an interrupted black line; terminal line black, wavy; reniform stigma outlined in pale ochreous; fringes blackish, marked with pale brown below apex and about middle; each of these patches run through to subterminal line. Hind wings blackish, a white medial patch, with indications of extension to costa and dorsum. Underside of fore wings blackish, whitish towards base and on dorsal area; a white transverse band beyond middle, whitish marks on termen; basal half of hind wings whitish, outer half blackish, a blackish ring about middle, from which a line of the same colour runs to costa and a less distinct shade to dorsum; fringes as above.

Expanse, 44-50 mm.

Three females from Haight's Place, Pauai, subprov. Benguet Luzon (7000 ft.), November 8th and 30th and December 3rd, 1912.

Hypena luzonensis, sp. n.

♂. Fore wings ashy-grey with a large blackish brown patch on costa, which extends almost to dorsum and projects outwards to the apical streak, where it terminates in a point. Except on the costa this

patch is edged with white and encloses two black marks, one punctiform, the other linear. Hind wings fuscous with black discal dot. Under-side fuscous, marking of fore wings showing a black discal dot and line beyond on the hind wings.

Expanse, 40 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 10th, 1912.

Near *H. rhombalis*, Guenée.

Hypena nebulosa, sp. n.

♂. Head thorax and abdomen dark brown; palpi dark brown, very long. Fore wings brown clouded with darker on costal area, irrorated with black, sprinkled with greyish on middle of disc; a greyish apical streak; postmedial and subterminal lines dark brown, both bent outward above middle. Hind wings dark fuscous, fringes greyish at tips. Underside fuscous, costa of fore wings greyish flecked with fuscous; hind wings with a black discal dot and broad dark band beyond.

♀. Very similar, but the brown coloration is redder in tint, greyish is rather more prominent on discal area and the greyish mark at apex is broader; hind wings rather paler than in the male.

Expanse, 40 mm.

Three males and two females from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November, 1912.

Allied to *H. longipennis*, Walker.

Hypena variegata, sp. n.

♀. Palpi, head and thorax dark brown; abdomen paler brown. Fore wings brown with paler shades on outer third; subbasal line black, short; antemedial line black, slightly sinuous, internally edged with pale brown and preceded by two black marks about middle; postmedial line black, rather sinuous, outwardly edged with pale brown, followed by a sinuous blackish shade-like line extending from costa almost to dorsum; subterminal line black, sinuous, broken up into dots towards dorsum; space between the postmedial and subterminal lines pale brown; an, almost quadrate, pale brown patch on costal area between subterminal line and termen; pale brown dots on costa between postmedial and apex; black dots inwardly edged with pale brown on terminal ends of the veins; discoidal marks black, obscurely edged with pale brown. Hind wings dark fuscous, discal dot and line beyond black, the latter edged with pale brown. Underside pale brown, suffused with blackish on the fore wings and stippled with the same on the hind wings; two white dots below costa towards apex on fore wings and a dark brown discal dot and curved line on hind wings.

Expanse, 39 mm.

A female specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 9th, 1912.

Belongs to the *obsitalis* group of *Hypena*. There are three unnamed specimens from Ceylon in the B.M. Collection.

Hypena (?) *albipicta*, sp. n.

♂. Head, thorax and abdomen blackish brown, the latter with darker tufts. Fore wings blackish brown, a white dot in cell and a white sinuous postmedial line; the antemedial and subterminal lines are whitish with dark edges; both are sinuous, but not well defined. Hind wings dark fuscous. All wings have a pale terminal line preceded by black dots; fringes of fore wings freckled with white at apex. Underside fuscous grey; the fore wings with medial and postmedial dusky lines, the latter marked with white on costa; hind wings have a black, discal mark and two blackish lines beyond, the outer line broad, diffuse and interrupted.

Expanse, 31 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), January 12th, 1912.

Pseudaglossa (?) *basalis*, sp. n.

♂. Antennæ knotted below middle; head, thorax and abdomen chocolate brown, basal third ochreous brown clouded with darker; antemedial line ochreous brown, almost straight, but slightly indented near costa; postmedial line ochreous brown, inwardly edged with blackish, sinuous to middle, thence crenulate to dorsum; subterminal line pale brown, crenulate; orbicular stigma ochreous, punctiform; reniform stigma outlined in ochreous, enclosing a chocolate-brown lunule; terminal dots black, inwardly edged with ochreous; fringes of the ground-colour traversed by a faint greyish line. Hind wings fuscous on basal two-thirds, paler on outer third; basal area limited by a dusky line, outer area traversed by a dusky, diffused band; terminal line black, interrupted towards costa; fringes fuscous. Underside of fore wings with two ill-defined ochreous lines on outer third, the first curved, the other nearly straight but interrupted; terminal dots as above, without ochreous edge; hind wings ochreous, heavily freckled with fuscous, discal mark black, a sinuous blackish line beyond; terminal dots black, preceded by an interrupted ochreous line.

♀. Agrees with the male except that the reniform stigma is entirely white and the hind wings are dark fuscous, almost blackish on basal area.

Expanse, 40 mm.

One male and three female specimens from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), taken in 1912—the male on November 7th, the females November 16th and 23rd and December 11th. One ♀ (November 16th) has the reniform stigma as in the male described.

A NEW FORM OF *TAJURIA* (LEP. RHOP.) FROM CEYLON.

By N. D. RILEY.

Tajuria jehana ceylanica, ssp. nov.

♂. Differs from typical *jehana* in the greater extent of the blue area on the fore wing above. In typical *jehana* this extends from inner margin to vein 2, and, in the cell, from the base to just beyond vein 2. In *ceylanica* it extends in the cell to beyond vein 3 and from the inner margin to vein 3, with a few scattered blue scales in area 3, and approaches the hind margin more closely as well. On the hind wing the black marginal spots in areas 1c and 2 are slightly reduced in size. This latter feature also applies to the under-side, which otherwise presents no conspicuous difference.

♀. The differences are of a similar nature. The blue is of a more silvery shade on both wings. It occupies the whole of the cell with the exception of the anterior distal quarter, extends from inner margin to just over vein 4, and its outer margin runs very evenly and almost parallel, but not very close to the hind margin. On the hind wing the marginal spots are as in the male, the discal wavy dark line very narrow. On the under-side this line is continued rather conspicuously (for this species) on the fore wing.

Length of fore wing: ♂, 14 mm. (16 mm. in ♂ type of *jehana*); ♀, 15.5 mm. (the same as in the ♀ type of *jehana*).

B.M. Type No. Rh. 190, ♂; 191, ♀, Kankasanturai, Ceylon, W. Ormiston.

The species appears to be very rare in Ceylon, there being in the British Museum only, in addition to the types, 1 ♂, 1 ♀, obtained by Mr. Fairlie, who first discovered the species in Ceylon, and 1 ♂ from Mr. E. E. Green. It differs quite constantly from the continental Indian specimens in the British Museum.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

By THOMAS GREER.

(Continued from p. 116.)

Hypeninae.

Zanclognatha tarsipennalis, Tr.—Not uncommon locally; near Killymoon, at Stewartstown, and Tamnamore.

Zanclognatha grisealis, Hb.—Fairly abundant and widely distributed; near Cookstown (H.), at Killymoon, also at Stewartstown and Tamnamore.

Hypena proboscidalis, L.—Abundant almost everywhere among nettles.

GEOMETRIDÆ.

Geometrinæ.

Pseudoterpna pruinata, Hufn.—Locally abundant among broom and gorse.

**Geometra papilionaria*, L.—Local but widely spread; near Lissan, in lanes near Cookstown (H.), in birch woods at Killymoon, and in alder swamps near Stewartstown.

**Geometra vernaria*, Hb.—Taken in some numbers by Messrs. J. S. Wilson and G. Coulter near Coalisland ('Entom.', vol. i, p. 237, and vol. li, p. 187); no doubt introduced at some time with *Clematis vitalba*, which is common in gardens in the locality.

Iodis lacteria, L.—Locally abundant in woodlands.

Acidaliinæ.

**Acidalia (Ptychopoda) inornata*, Haw.—Not uncommon among heather and birch scrub, at Tamnamore.

Acidalia (P.) aversata, Hb.—Generally abundant; var. *spoliata*, Staud., at Lissan and Tamnamore.

Acidalia (P.) bisetata, Hufn.—Abundant and widely distributed; var. *finbriolata*, Step., not uncommon near Cookstown (H.) and Lissan.

Acidalia (P.) dimidiata, Hufn.—Common locally.

Ephyra pendularia, Clerck.—Kane found this species fairly abundant at Favour Royal and Altadiawan; it is (or was before the birch woods were felled) not uncommon at Killymoon.

HYDRIOMENIDÆ.

Ortholitha plumbaria, Fb.—Abundant generally among gorse and broom.

Ortholitha limitata, Scop.—A common species in rough meadows.

**Odezia atrata*, L.—Locally abundant in meadows at Lissan, and near Stewartstown.

Anaitis plagiata, L.—Locally not uncommon and widely spread; in woodlands resting on tree trunks, and on moorlands on the rocks.

**Chesias spartiata*, Fues.—A common species among broom, *Cytisus scoparius*.

Lobophora (Trichopteryx) carpinata, Bork.—Fairly abundant at Favour Royal and Altadiawan (K.); near Lissan and at Killymoon, where banded forms approaching *ab. fasciata*, Prout., occur.

Lobophora (T.) viretata, Hb.—Not uncommon among hollies at Lissan; Altadiawan, one example (M.F.), *vide* Kane.

Lobophora halterata, Hufn.—Local and not abundant; a few at Favour Royal (K.); larvæ beaten from sallow near Cookstown (H.).

**Lobophora sexalista*, Hb.—Very rare among salallows near Stewartstown.

Chæmatobia brumata, L.—Very abundant.

**Triphosa dubitata*, L.—Rare at ragwort blossom in September near Stewartstown.

**Eucosmia undulata*, L.—Very rare near Lissan.

Eustroma silaceata, Hb.—Locally abundant at Favour Royal (K.); also at Lissan, Killymoon and near Stewartstown.

**Lygris prunata*, L.—Abundant in gardens at Stewartstown; not uncommon in woods at Loughry, and Killymoon; also near Grange.

Lygris testata, L.—Abundant and wide-spread on the mountains, bogs and marshes; in the local form the males are mostly purple and the females yellow.

Lygris populata, L.—Very common in similar localities to the last species and also in woodlands; a form near var. *musauria*, For., at Lough Fea.

**Cidaria pyraliata*, Hb.—Abundant and widely spread in the district.

Cidaria fulvata, Forsk.—Not uncommon locally at Favour Royal (K.); near Lissan and Stewartstown; a few near Cookstown (H.).

Cidaria corylata, Thun.—Abundant at Favour Royal (K.); not uncommon at Lissan and near Cookstown.

Cidaria truncata, Hufn.—Abundant in May and June and again in September; vars. *comma-notata* and *perfuscata*, Haw., not uncommon; in several of the former the yellow colour does not extend to the costa, which is dark, as also the base and outer margin of fore wings.

Cidaria immanata, Haw.—A most abundant species and very variable; handsome forms of *marmorata*, Haw., are common; one example approaching var. *thingvallata*, Staud., but with a small spot of white in the black median band, near Lough Fea.

Cidaria siterata, Hufn.—Usually abundant; the females of a rich dark green suffused with rose colour.

Cidaria miata, L.—Common, but rarer than the preceding species.

Thera obeliscata, Hb.—Locally abundant in pine woods; the black form, var. *obliterata*, at Killycolpy Wood, Lough Neagh.

Lampropteryx suffumata, Hb.—Abundant and widely distributed; dark forms approaching ab. *piceata*, Step., at Lough Fea.

Coremia (*Ochyria*) *munitata*, Hb.—Locally abundant and wide-spread, occurring at Lough Neagh (60 ft.) as well as on the mountains at 2000 ft. in the Sperrin range; also at Favour Royal and Altadiawan (K.), near Lissan, Lough Fea and at Stewartstown.

Coremia (*O.*) *unidentaria*, Haw.—Abundant in damp localities; red and dark purple banded forms.

(To be continued.)

OXIGRAPHA LITERANA, L.: ITS LIFE-CYCLE, DISTRIBUTION, AND VARIATION.

By W. G. SHELDON, F.Z.S., F.E.S.

(Continued from p. 190.)

Ab. suavana, Herrich Schäffer.

Synonymy.—*Suavana*, Herr. Schöff., Schmett. von Eur., iv, p. 152, and Tort., plate i, fig. 1 (1849); Staudinger, Cat. Pal. Lep., ii, p. 82, No. 1458 (1901); Spuler, Schmett. Eur., p. 242 (1908); Kennel, Pal. Tort., p. 83 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (Tort. *suavana*, Herr. Schöff., 'Schmett. von Eur.,' iv, p. 152, and 'Tort.,' pl. i, fig. i [1849]).—*Laete viridis*, albido mixta, undulis transversis nigerrimis; linea limbali tota et ciliarum dimidos basali in costis nigris.

I have not seen a British specimen which quite agrees with Herrich Schäffer's figure or description. I have several from the New Forest which come pretty near to them, but they have not the "whitish" blotches of the type.

Ab. nigromaculana, n. ab. (Plate I, fig. 6.)

I cannot find that this form has been noticed by any author who has written upon *literana*. I describe it as follows: Superiors of the deep green colour, and with the black dotting of *ab. squamana*, with the addition of several large and prominent blotches; these are not so clearly and sharply defined as in *literana*, type: there is one in the inner margin of the base, one near the centre of the disc, and a third on the costa; the positions of these blotches is best understood by reference to the plate. The aberration is exactly similar to *ab. fulvomixtana*, Steph., with the exception that it is without the fulvous blotches. My specimens, six in number, came from the New Forest. I have not seen examples from another locality.

Ab. fulvomixtana, Stephs.

Synonymy.—*Fulvomixtana*, Stephs., Cat., ii, p. 188, No. 7098 (1829); Stephs., Haust., iv, p. 166 (1834); Curtis, Guide, p. 173 (1829); Rennie, Conspect., p. 180 (1832); Curtis, Brit. Ent., p. 440, No. 5 (1833); Wood, Index Ent., fig. 1102 (1839); Westwood, Brit. Moths, pl. 96, and p. 165 (1845); Staudinger, Cat. Lep. Eur., p. 234 (1871); Snellen, Vlinders, p. 176, No. 8 (1882); Staudgr., Cat. Pal. Lep., ii, p. 82 (1901); Spuler, Schmett. Eur., p. 242 (1908); Wagner, Lep. Cat., par. x, p. 69 (1912).

Original description (*Leptogramma fulvomixtana*, Stephs.).—"Anterior wings rough, of a light green, the disc with darker clouds, irregularly mixed with fulvous and black ones; in general

there is a conspicuous black spot at the base of the inner margin, and another on the costa towards the apex, with smaller ones on the disc, more or less distinctly mixed up with the fulvous clouds or spots; posterior wings brownish." "Some examples are destitute of the black clouds, and are only adorned with pale fulvescent spots on a green ground."

Stephens first named this aberration in his 'Catalogue' in 1829, but did not describe it until 1834 in 'Haustellata,' iv, p. 166. The examples which he describes as "destitute of black clouds" refer to the next aberration. The type-specimen, which was figured by Wood, fig. 1102, is now in the National Collection, and it agrees well with Stephens's description. *Ab. fulvomixtana* is not by any means a common form. I have obtained only three examples out of many hundreds examined: these came from the New Forest.

Ab. aerugana, Hübner.

Synonymy.—Hübner, Tort., fig. 92 (1797) (named *squamulana*); Hübner, Verz., p. 386, No. 3750 (1826); Westwood, Brit. Moths, pl. 96, figs. 11 (*squamana*) and 14 (*fulvomixtana*) (1845); Kennel, Pal. Tort., taf. 5, fig. 2, and p. 83 (*squamana*) (1908).

Ab. aerugana was first figured by Hübner in 1797, 'Tort.,' fig. 92, but named (with figs. 93, 94 and 95) *squamulana*. In 'Verzeichniss' (1926) he names fig. 92, 'Tort.,' *aerugana*.

Fig. 92 is a very good one and is unmistakable. It portrays a form with the green colour of *ab. squamana*, mixed with darker cloudings, fulvous blotches and black dots. The basal fascia and central group of lines which are found in *literana* type are somewhat lightly indicated, but are apparent.

I have eighteen examples from the New Forest which agree with Hübner's figure with the exception that the black lines are not so strongly indicated, and in some instances require the aid of a magnifying glass to detect. I have no doubt but that this is the form which Stephens describes with *ab. fulvomixtana* as—"some examples are destitute of the black clouds, and are only adorned with pale fulvescent spots on a green ground." The majority of my specimens would agree with this description, unless examined very critically with a magnifying glass.

NOTES ON THE OCCURRENCE OF *ANOSIA PLEXIPPUS* IN ENGLAND.

BY PAYMASTER-IN-CHIEF GERVASE F. MATHEW, R.N., F.L.S.,
F.E.S.

MR. FROHAWK's notes on this species in the 'Entomologist' for last month, pp. 145-6, has recalled to my mind what I believe to have been a view of this butterfly actually arriving in

England. I made a note of it at the time in my journal, but did not send it for publication, as I did not feel quite positive. However, I think there can be little doubt about it. I have seen this fine butterfly so many times flying over and about ships I have been on in the Pacific, North American, Australian and other stations, also in their native haunts on shore, where, in some places, they were exceedingly plentiful, so it is not likely I could have been mistaken. It is a strong flier and as a rule flies high. When flying about a ship it generally keeps up aloft among the spars and rigging, where I have sometimes seen them settling down for the night. On shore I have seen them congregating in hundreds towards sunset, and taking up their quarters on the under-sides of drooping branches of forest trees and usually pretty high up.

The following is an extract from my journal of October 1st, 1917, while I was living at Instow, North Devon: "Saw what I think may have been *A. plexippus*—a very large butterfly which came flying in from the sea—flapping along and soaring. It passed some fifty yards on one side of me at a height of about a hundred feet, so I could not make out its markings very distinctly, but it was a big, dark-looking butterfly, and if not *plexippus* I do not know what it could have been." It was a lovely bright day with a very light N.E. breeze and I was in a marshy field near the beach, and the butterfly came straight in from the direction of Barnstaple Bar and the Bristol Channel.

Of the few examples of this species which have been taken in England I had the pleasure of seeing one alive. It was in September, 1885, while I was at Devonport paying off in H.M.S. "Espiegle" after a four years' commission on the Australian station. On the evening of the 24th of that month I accompanied my old friend, the late G. C. Bignell, to the house of Mr. F. F. Freeman, on the Hoe, to look at his collection of European Rhopalocera. While we were there we discussed, among other things, the occurrence of *plexippus* on several occasions of late years in this country, and wondered how it managed to cross the Atlantic. The next day Mr. Freeman came to Devonport to see me and brought with him a living specimen of *plexippus*, which he had captured that morning in a street near the Hoe! Of course I was very pleased to see it, and thought it rather a curious coincidence after our conversation on the previous evening. It was a fine large example and in good condition. The only record I can find of this capture is a brief notice in the 'Proceedings of the Entomological Society' for October 7th, 1885, where it states that "Mr. F. F. Freeman sent a communication recording the recent capture of a specimen of *Danaüs archippus*, Fabr., at Plymouth."

Dovercourt, Essex;

June 14th, 1921.

NOTES ON BRITISH NEUROPTERA IN 1920.

BY W. J. LUCAS, B.A., F.E.S.

ALDER-FLIES.—*Sialis lutaria*, Linn. was taken in the New Forest on 11 and 21 May (Lucas). *S. fuliginosa*, Pict., which is usually considered to be somewhat later than its congener, was taken there on 13 May, and on 24 May was not infrequent in Dames Slough Inclosure. Both species occur together at Blackwater in the New Forest; in Yorkshire, however, *S. fuliginosa* occurs about rapid streams, whereas *S. lutaria* favours ponds and slow-flowing rivers (Porritt). *S. fuliginosa* was taken at Camberley in Surrey on 6 June (Green).

SNAKE-FLIES.—At Esher Common, Surrey on 7 August a larva of *Raphidia* (probably *R. maculicollis*, Steph.) was found some five or six feet above the ground, under the bark of a dead but standing Scotch Fir, on which the bark was dry. The larva, therefore, does not require a damp situation. If the species was *maculicollis* it must by appearance have been full grown or nearly so.

BROWN LACE-WINGS.—On 21 May I captured two examples of *Osmylus chrysops*, Linn. at Blackwater in Dames Slough Inclosure, while on 24 May this insect was very frequent at Blackwater in the same inclosure. Sometimes the wings were glossy, so presumably they had but recently emerged. This species, although far the largest of our Hemerobiids, has but a feeble flight, not long sustained. On tapping a bush (Rose if I recollect rightly) overhanging the stream quite a number would take to flight; but they quickly settled down again close by. At rest they carry their wings after the manner of *Hemerobius*. They have quite the appearance of an ant-lion, resembling *Palpares libelluloides*, Linn. in miniature. My last sight of the species was on 4 July, at Hurst Hill, also in the New Forest. C. L. Withycombe took one on 24 May at Sevenoaks and several others at a later date. *Hemerobius elegans*, Steph. was taken at Epping Forest—six on 21 July and two on 20 August (Withycombe). Of *H. micans*, Oliv., one was captured on the wing in poor weather at Dunley Hill, Surrey, on 6 June (Lucas); E. E. Green took it on 7 May at Camberley and a small female example in very teneral condition was taken in the New Forest on 28 August. It had a ruddy head with black eyes, pale yellow thorax, and very pale abdomen with black appendages (Lucas). *H. humuli*, Linn. was met with on 5 June at Harpenden, Herts, and on 7 May at Camberley (Green). *H. subnebulosus*, Steph. was found at Camberley on 8 May and 8 June (Green); *H. stigma*, Steph. in the same locality on 11, 12, and 19 July (Green); and *H. quadrifasciatus*, Reuter, there also on 31 May (Green). In the Epping Forest District Withycombe took *H.*

micans, *H. humuli* (not common), *H. lutescens*, Fabr., *H. subnebulosus*, *H. stigma*, and *H. concinnus*, Steph. He also found two *Micromus paganus*, Linn. in June at Walthamstow, Essex.

GREEN LACE-WINGS.—The following were met with in 1920: *Chrysopa vittata*, Wesm., 12 June, near Horsley, Surrey (S. London Ent. Soc. Excursion), and Stanmore Common, Middlesex, on 3 June (Lucas); *C. flava*, Scop. expanding its wings on herbage by the side of a pond on Epsom Common, Surrey, on 11 June, and a rather small example at Esher Common on 15 July (Lucas); *C. alba*, Linn. on 19 and 29 May in the New Forest, and on 3 June at Stanmore Common (Lucas), also near Horsley on 12 June (S. Lond. Excur.); *C. tenella*, Sch. one on 27 May in the New Forest somewhat teneral and not fully coloured (Lucas); *C. prasina*, Ramb. on 21, 23 and 28 June, and 5 July in New Forest, near Claygate, Surrey, on 15 July (Lucas). *C. perla*, Linn. near Horsley on 12 June (S. Lond. Excur.), New Forest 24 June (Lucas), Byfleet Canal, Surrey, on 24 July (S. Lond. Excur.). Withycombe tells me that in the Epping Forest District *C. flava*, *C. alba*, *C. tenella*, *C. septempunctata*, Wesm. and *C. perla* were found from June (or end of May) on till July and August. *C. flava* and *C. perla*, however, were as usual over by the beginning of August. On 29 November he took the winter form (*carnea*, Steph.) of *C. vulgaris*, Sch. in a garden at Walthamstow.

SCORPION-FLIES.—The first seen was a specimen of *Panorpa germanica*, Linn. at Horsley on 26 April. *P. communis*, Linn. was captured on 8 May in the Roy. Hort. Soc. Gardens at Wisley. A male of the same species was found on 22 May and a female on 29 May in the New Forest, while in the same locality females of *P. germanica* were met with on 26 and 27 May. On 3 June at Stanmore Common both species were taken. On 9 June Panorpas were numerous near Horsley and both species were taken, as also they were on 12 June (S. Lond. Excur.), but the latter were more frequent. From 18 June till 8 July both species seemed common in the New Forest. In fact on the dull threatening morning of 4 July Dr. Tillyard and myself found both species very numerous at Hurst Hill, especially on the bracken fronds: most were males. Two females of *P. communis* were taken at Byfleet Canal (S. Lond. Excur.) on 24 July, and a male *P. germanica* was captured at Harelane, Surrey, on 16 August (Lucas).

28, Knight's Park,
Kingston-on-Thames.
June 1st, 1921.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 195.)

Agbalus viridis, sp. nov.

Medium sized. Below, rather dark, blackish green; above, shining, æneous green metallic; thorax narrow in front, minutely punctured; elytra elongate, closely punctate in regular striæ; ♂ with a thorn-like prolongation near the apex of the hind femora.

Type, 3 ♂, ♀, Costa Rica (Biolley).

Length, 5 mm.

Head with a few fine punctures, and with the ordinary transverse and longitudinal grooves; labrum fulvous; antenna with four or five basal joints fulvous, remainder dark; thorax strongly narrowed in front, sides feebly rounded and narrowly margined (like *chiriquensis*, Jac.); surface finely punctured; elytra elongate, with shallow transverse depression, closely and strongly striate punctate, coarser at the base and sides; legs with tibia and tarsi more or less rufescent.

This form is nearly related to *chiriquensis*, Jac., and of the same narrow elongate shape, and forms the northern representative of the group composed of *subcostatus*, Jac., and *bolivianus*, Jac. This last species is described by Mr. Jacoby, as above, metallic greenish, and with fulvous legs. Forms occur with legs nearly dark, and also with the upper surface blue or purple, all from the same locality; I regard them all as varieties of *bolivianus*.

Alethaxius carinipennis, sp. nov.

Size large, elongate, parallel. ♀ broadened; in ♂ dark, shining, metallic æneous green; head coarsely, aciculate punctate, sparse at the vertex; thorax rather sparsely punctured, with large and small punctures mixed; elytra strongly, almost regularly seriate punctate, the humeral interval in the ♂ developing into a strong carina, extending from almost the middle nearly to the apex; ♀ has this carina replaced by a more or less double row of strong rugosities, which begin with the shoulder and extend to the apical third; legs rufous, more or less cyaneous.

Type, 3 ♂, 2 ♀, Equateur.

Length, 5.5-7 mm.

The head has a deep triangular fovea on the front, between the eyes; apex pointing backwards, the sides forming a fairly well-defined carina, running to the base of the antennæ; the labrum is rufous cyaneous. Antennæ extend to the middle of the elytra, dark, with the lower joints more or less rufous, scarcely thickened at the end; thorax wide, strongly margined, and bisinuate at the middle; the punctuation is rather sparser and

finer at the base and middle than the sides; the elytra have a distinct though short depression, better defined in the ♀ than ♂; the carina in the latter gives the elytra a broad appearance, which is lacking in the other sex, and the punctuation is, as in many cases, very fine at the apex; in the ♂ the body below is dull bluish black, sometimes tinged with metallic; the ♀ with the last abdominal segment compressed into a short carina; the legs vary from rufous more or less coloured with cyaneous blue to nearly dull cyaneous bluish.

The ♀ is shaped very much like the ♀ of *variabilis*, Jac., except the antennæ are not as short. The specimen upon which the small measure is based is a ♂ and almost wholly cyaneous blue below, and the carina is well marked almost to the shoulder, otherwise it seems the same.

There are certain forms from Cachabè which I had originally separated as distinct, on account of the smaller size (5 mm.), less carinate elytra, which gives a somewhat different form, but for the present I put them all together.

Alethaxius ænea, sp. nov.

Size of *variabilis*, Jac.; elongate, parallel. Body below shining æneous, last abdominal segment rufous; above, shining, æneous bronze; head and thorax very lightly and finely punctate; elytra lightly punctate striate, the humeral interval obsoletely carinate for the middle two-thirds of its length; legs rufous, the base and apex of femora brown, and tibia and tarsi more or less shaded with cyaneous brown.

Type, ♂, Cachabè, low c., November, 1896 (Rosenberg).

Length, 6.5 mm.

Labrum and palpi yellow, jaws large and black, antennæ slender, half the length of the body, yellow, most of the joints partly infuscate; head convex, remotely punctate, thickly on the epistome, deeply transversely depressed, and with a longitudinal sulcation running nearly to the back edge, but not very deep; thorax convex, distinctly collared in front, and with a small wide fovea each side on the disc back of the middle; all the angles prominent, sides strongly bisinuate, elytra noticeably transversely depressed, with somewhat raised scutellar area; the striate punctuation fine, but distinct to apex; ♀ unknown. The smooth appearing bronze surface at once distinguishes this form.

Alethaxius pallida, sp. nov.

Elongate, parallel, shining, entirely castaneous yellow, or light brown; the apical joints of the antennæ and jaws a little darker, eyes black; head and thorax sparsely, finely and very remotely punctulate; elytra finely striate punctate, the intervals faintly raised at the apex.

Type, 2 ♂, Cachabè, low c., August, 1897 (Rosenberg).

Length, 4 mm.

Head with usual transverse depression, and a small fovea in place of the longitudinal sulcation; antennæ long and slender, reaching below the middle of the elytra; the sides of the thorax margined and bisinuate at the middle; transverse depression of the elytra fairly well marked. Easily distinguished by the shape and light colour. Judging from the description these three forms seem allied to *nigritarsis*, Jac., which I have not seen.

Rhabdopterus, Lef.

The history of *R. piceipes*, Oliv., has been reviewed by Dr. Horn in 'Trans. Am. Ent. Soc.,' vol. xix, p. 226; the species was described originally as coming from Carolina. I have a series of specimens marked "Louisiana, A. Salle," the ♀'s of which I find very difficult to reconcile with Dr. Horn's description. They agree a good deal better with the original description of *piceipes* than they do with Say's description of *pratexta*. This, however, is only a suggestion, but I wish Dr. Horn had seen my specimens.

Mr. Jacoby, in his paper on the Coleoptera of St. Vincent, in 'Trans. Ent. Soc. London,' 1897, p. 257, gives *piceipes* as one of the list. In his second collection, part of which is in my possession, these St. Vincent specimens are named (his original label) *piceipes*, Oliv. ?; it is evidently a different species from our form, there is no sinuation to the hind tibia of the ♂ and the size is greater—I call it *grenadensis*. Mr. Blatchley has sent from Dunedin, Florida, ten or a dozen specimens as *piceipes*, which are evidently not, as the hind tibia of the ♂ is strongly dilated at its apical half, and the form is larger and stouter. I call it *blatchleyi*.

(To be continued.)

NOTES AND OBSERVATIONS.

WATSON'S "SPEERA" BINOCULAR MAGNIFIER.—Messrs. W. Watson & Sons, Ltd., of 313, High Holborn, have recently brought out a new magnifier, which will be of great assistance to entomologists in dealing with small insects. There have been various devices invented in the past for this purpose, but the one I am discussing is far in advance of any I have seen for utility in pinning and setting small insects. It consists of a pair of binocular achromatic lenses, mounted in spectacle frames, and set at such an angle to each other that the vision converges on the focal point. The magnifiers are made in three powers, the focal lengths of the pair of lenses being 5, 7 and 10 in., giving magnifications of 3.5, 2.5 and 1.75 diameters respectively. The cost is £2 per pair. The great advantages about the magnifiers are that they leave both hands free, they suit all sights, and if higher magnification is required, this can be obtained by holding an ordinary lens in the hand at focal distance from the object looked at. Anyone wishing to avail themselves of

this invention should write to Messrs. Watson for a descriptive and illustrated circular which they issue. W. G. SHELTON.

REARING THE LARVÆ OF *MELIPHA CINXIA*.—In reading "Notes on Lepidoptera at Alton," contributed by Mr. E. A. C. Stowell and published in the 'Entomologist' for May, I was struck by his observation that he found *cinxia* larvæ very hard to rear, and only bred eight imagines from about thirty-six larvæ. Is the successful rearing of this species dependent upon climatic conditions? That kind friend and enthusiast, the late General Grant, when residing in the Isle of Wight, sent me batches of larvæ on several different occasions, and I never had the slightest trouble in rearing them in Devon. Though I did not actually count the larvæ received, some of which were often quite small, so far as I am aware none of them died. My method of treatment was simple. I got an ordinary hat-box; I took the top out of the lid and put in its place a piece of net to allow the free admission of air and sun. The box was placed in front of a south window, or in an unheated greenhouse, with all doors and windows open, and tilted forward so as to get all the sunshine possible. To feed the larvæ I placed a layer of quite small plants of the narrow-leaved plantain at the bottom of the box. I obtained these from a weedy lawn by cutting them off with an old knife about an inch below the surface of the ground. I never used the large, rank plants that are to be found in meadows and by the roadside. Early every morning I placed a fresh supply of these little plantains on the top of the food already there, much of which was, of course, withered up. I removed from time to time dead bits and *débris*, but never turned the box out, and took great care not to disturb any larvæ that might be changing. The food, given fresh daily, was generally damp with dew. Treated thus, my *cinxia* larvæ appeared to thrive admirably. They duly pupated, but the boxes were not moved until the imagines emerged. Of the large number bred I have only had one really nice variety. The required treatment seems so simple that I am forced to the conclusion that climatic conditions are the essential factor in rearing the larvæ of *M. cinxia*.—C. M. MAYOR; Bank House, Dawlish, S. Devon.

THE ADAPTATION OF CATERPILLARS TO THEIR SURROUNDINGS.—Last season a wild *B. gemmaria* female in my possession laid a batch of ova which hatched in due course. I placed the young caterpillars in metal and cardboard glass-topped boxes. When the time came to transfer them to a breeding-cage I was surprised to find that in each case the caterpillars had as nearly as possible assumed the coloration of their surroundings—that is to say, that those in the cardboard box (which of course had white sides) were of a very light brown colour, those in the metal boxes very much darker, while those that had been in a metal box the sides of which were considerably discoloured were almost black. When hatched the whole brood were of the usual reddish-brown colour of this species, and all have been fed throughout on privet. It would be interesting to know what effect, if any, this question of larval environment has on the perfect insect.—N. O. R. SERJEANT; Eardiston, Barnet Wood Lane, Ashted, Surrey.

NOTES ON PUPATION OF *NONAGRIA TYPHÆ*.—During autumn I generally collect many pupæ of *Nonagria typhæ*, Esp., and perhaps two occurrences which came under my notice in 1920 may be of interest. Up to the autumn of that year I always imagined that this moth emerged from a pupa which lay in the bulrush with its head pointing downwards, and that the hole from which in due course the moth would emerge was beneath the pupa and entirely open when the outside leaves were stripped away. Amongst several pupæ taken in the Churnet Valley in the autumn of 1920 was one which had pupated head upwards with the emergence hole consequently above it. Another curious fact was that the hole itself was not gnawed *through* the reed-stem, but covering it was the outer skin of the stem, resembling somewhat the mode of pupation of *N. geminipuncta*, Hatch. The resulting moth was a typical *N. typhæ*, although it did not emerge until October 31st, a fortnight later than the last of my other pupæ taken at the same time. Another occurrence of interest was that of two *N. typhæ* pupæ which were found in the same stem. In this case the larvæ had both pupated normally with their heads pointing downwards and within an inch of each other. The path of the upper pupa was completely obstructed by the pupa below, and it is difficult to see how the moth of the former could have got away from the stem had the lower pupa still been intact. The process of emergence would have been a very difficult matter in the wild state in any case, and had I not removed most of the pupæ from the rushes possibly the occurrence would have been undetected.—THOMAS SMITH; Whiston Eaves, Fröghall, Staffordshire.

SECOND BROOD OF *NISONIADES* (*THANOAS*) *TAGES*.—While at Swanage, Dorset, on July 20th and 24th, I captured two male specimens of *Thanoas tages*, and again on August 9th at Hockley, Essex, I took another male example in good condition. All three specimens are more distinctly spotted with cream colour than any of those of the normal spring brood in my series. The submarginal row of cream spots in both the fore and hind wings are very conspicuous, giving the specimens a banded effect. The whole colouring has a more ochreous appearance. A second emergence of this species is quite exceptional, and due to unusually fine warm summers as that of 1893 and the present season.—F. W. FROHAWK; August, 1921.

NISONIADES TAGES, LINN.—On July 26th last I saw a Dingy Skipper in the New Forest. As I examined it at close quarters it seemed to be in good condition, and I have no doubt it belonged to a second brood.—W. J. LUCAS.

EMERGENCE OF *HESPERIA MALVÆ*.—With reference to the above (*antea*, p. 195), I am surprised that over such a long period of years Mr. Raynor did not come across a specimen earlier than May 5th. I have not kept records, but the specimens in my cabinet are dated April 27th and 28th, 1912, May 13th and 25th, 1913, and April 25th, 1914. These specimens were all taken on chalk hills in Kent. Although I cannot turn up any dates, I have no doubt that in certain

years this insect is double brooded.—FREDERICK GILLETT; Cheriton House, Sevenoaks, Kent.

APORIA CRATÆGI, L., IN CYPRUS.—On June 28th I took three males of this species, and a fourth male on July 2nd near Platres, on the southern range of mountains. Dr. Guillemard reported this species from the island in 1887, but it has apparently never been taken since, and was considered a doubtful species (*vide* "The Butterflies of Cyprus," by Hy. J. Turner, F.E.S., 'Trans. Entom. Soc. Lond.,' July 26th, 1920, etc.). All four specimens are very worn.—KENNETH HAYWARD, F.E.S. (Capt.); Reservoir, Aswan, Egypt.

PORTHESIA SIMILIS, FUES., IN CUMBERLAND.—The records of this moth for Cumberland appear to be limited to one from Carlisle by our pioneer county entomologist, the late T. C. Heysham, who flourished in the early half of last century. This record was repeated by Morris, Stainton, 'The Victoria History of Cumberland,' and G. B. Routledge, the last-named in the 'Transactions of the Carlisle Natural History Society.' Being thus among our scarcest moths I was therefore extremely pleased to meet with a few specimens in July last in the village of Drigg, on the south-west coast of Cumberland. Three were found simultaneously on a garden wall, a fourth on the same wall the following day, a fifth in a hedge bank a short distance away, while a sixth obligingly paid a visit to my lodgings and advertised its presence on the front door!—F. H. DAY; 26, Currock Terrace, Carlisle.

AMPHIDASYS DOUBLEDAYARIA IN THE ISLE OF MAN.—In view of the rapid spread of *Amphidasys betularia* var. *doubledayaria* in England in recent years, it may be of interest to note that in June of last year I took a male specimen of this variety in the little village of Andreas, five miles from Ramsey, Isle of Man. I have been unable to discover if this form has been hitherto noticed in the island. The climate is damp, but mild. No lepidopterist seems to have lived in the neighbourhood for many years past, and immigration seems unlikely.—CYRIL I. PATON; Streatham College, Streatham Common, London, S.W. 16.

MANDUCA ATROPOS ON DARTMOOR.—Whilst collecting on the moor on May 16th, 1921, a farmer, Mr. Dart, of Shady Coombe, Hoo Meavy, near Yelverton, told me of a large moth which had flown into his house about the first week in November last, 1920. I saw it later, and, as might be expected, it is rather badly rubbed, having been kept in a large bottle since the above date. It is now in my possession.—S. T. STIDSTON, Engr.-Commr. R.N.; H.M.S. "Douglas," 4th Flotilla, at Devonport, May 17th, 1921.

PACHETRA LEUCOPHÆA IN BUCKS.—On the Bucks Chilterns last May I took a fine specimen of *P. leucophæa* as it was sitting on an ant-hill. Has this moth been reported from the district previously?—WALTER PIERCE; Queen's Road, High Wycombe.

COLEOPHORA AGRAMMELLA IN ESSEX.—Wishing to breed some specimens of *Phalonia alismana* (*Eupacilia udana*), I went to a small pond on the edge of a plantation about two miles from here

and gathered a good bunch of *Alisma* stems. Upon looking at them on May 24th I noticed a very small *Coleophora* on one of the dead stems, and upon examination was very pleased to find I had got a female of the above. If all is well I hope to find the larva later on. I may add that *Juncus conglomeratus* grows in abundance round the edge of the pond. This is a welcome addition to our Essex list. I have only heard of its occurrence in Herefordshire and Sussex.—
A. THURNALL; Wanstead.

PLATYPTILIA RHODODACTYLUS, F.—The occurrence of this very beautiful species so far north as Huntingdonshire seems worth recording. A female caught on the edge of a wood late in July, 1919, gave the clue to its presence, and a search among the briar bushes early in June, 1920, yielded a dozen larvæ and pupæ. Although hedgerows, full of wild roses and seldom trimmed, abound in the neighbourhood, the insect was only found in a very restricted locality (fifty yards of hedgerow), which perhaps accounts for its passing unnoticed before, in spite of many years' collecting in the neighbourhood. A casual reference to entomological literature seems to show that the species has very seldom been recorded in late years, though it is understood that it still occurs in its old haunts round London. Tutt, 'British Lepidoptera,' vol. v, pp. 256–267, states that the insect has only been noted in Essex, Kent, Middlesex and Surrey. It may also be of interest to quote a statement from the same source that the larvæ have proved destructive to garden roses on the Continent and also in the United States, to which it is supposed the larvæ had been imported in the course of trade in rose bushes. Presumably the pruning to which roses are usually subjected prevents the species from assuming the character of a serious rose pest in England.—
J. C. and F. H. FRYER; Chatteris.

LEPIDOPTERA IN THE ALTON DISTRICT.—I have had very little time this term for Entomology, but what I had I have devoted to the heather country. It was lucky, as there is very little heather left in Surrey and Hants after these disastrous fires. I had to cycle in the evenings about 6 miles from Alton to a very productive stretch of heath, but I found there nearly everything that occurs on such ground. *P. hippocastanaria* was taken on April 13th, and the second brood was out on July 2nd—very early. *Diacrisia sanio* was flying freely on June 13th, including female, and I have a few larvæ therefrom just spinning up now (July 29th). *Macrothylacia rubi* was very abundant. I caught two females on the wing in the afternoon, besides males. Other things were *Saturnia pavonia*, *Aspilates strigillaria*, *Acidalia straminata* (one tending towards var. *circellata*), *Lithosia complana*, etc. A curious find was a larva of *Calocampa exoleta* on heather, very conspicuous. I could not observe that it ate heather. It unfortunately died later, probably from eating lettuce: it was so hard to get any wild herbage that was not filthy with vermin and honeydew. Another curious occurrence was that in a very dry spot, among some birch trees, with no other vegetation but heather and dry wiry grass, I came upon a shoal of newly emerged *Acidalia emarginata*. I had only a few boxes left, but took seven or eight of the best in as many minutes. What could it have fed on? In a swamp by a large

heath pond a profusion of *Ctenobia rufa* flew at dusk; also I got *Tholomiges turjosalis* (I am nearly sure); it was very hard in the dusk to sort them out among the quantities of small pale micros that were flying, and with the temperature at 80° these little marsh moths dry up before you can set them properly. My other chief capture was a larva of *Odontosia carmelita*, taken on my coat-sleeve when tapping birch-trees with my net. No amount of beating would produce another; it did not look very healthy, but "went down." My *L. cuculla* emerged safely in June, rather late, but I cannot find any larvæ this summer.—E. A. C. STOWELL; Eggar's Grammar School, Alton, Hants.

VESPA CRABRO.—On July 26th last, in a warm bank facing the midday sun, I found a hornet's nest. The bank was covered with a layer of thick short heath, through an opening in which I watched the insects coming and going. One was captured, although of course there could be no doubt of their identity. I mention the occurrence as I fancy this is a somewhat unusual place for a hornet's nest.—W. J. LUCAS.

SPHECOLYMA INANIS.—Referring to notes on this species in the last volume (pp. 213 and 263), I am delighted to be able to report that I have at last met with the above fly. I was called to remove a nest of *Vespa germanica* from rockwork in a neighbour's garden, and after getting out the nest I had all but finished filling in the cavity again and was replacing the brick burrs of which the rockwork was composed when I espied on one of them a single specimen of *Sphocolyma*, which allowed me to box it with ease. Whether it had just recently emerged from the nest—by no means a large one—or whether it had just arrived there, I cannot say; the former alternative seems the more probable from the apparent sluggishness of the specimen. I saw no more specimens, and it was of little, if any, use to reopen the cavity on the chance of finding larvæ. Does anyone know whether this species is parasitic in wasps' nests or only a scavenger?—C. NICHOLSON; 35, The Avenue, Dale End, Essex.

MATERIAL WANTED.—Can anyone supply me with samples of any cereals containing specimens of the grain-feeding insects (beetles, moths, etc.)? I particularly want larvæ of *Tenebris* (both species and *Pyralis farinalis* and imagines of the grain weevils). I will pay postage for reasonable consignments.—C. NICHOLSON; 35, The Avenue, Hale End, E. 4.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 1st, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The President announced the death of Dr. Longstaff, and a vote of condolence was passed to his widow and relatives.—Dr. Sharp, M.A., M.B., F.R.S., etc., was elected a special life fellow. Mr. P. V. Castling, of Peshawar, India, and Dr. S. C. Harland, D.Sc., of Shirley Institute, Didsbury, were elected Fellows of the Society.—The Treasurer made a statement explaining that the Society as a friendly society had been pronounced free from all income tax,

except on the interest on the debentures. He also made a statement as to the portraits of distinguished entomologists that had been hung in the Society's rooms, and expressed the hope that other portraits and documents of entomological interest would be presented to the Society.—The President read a statement as to the death of a number of distinguished Russian entomologists during 1916–20.—Prof. Poulton exhibited varieties of *Pyrameis cardui* and an example of a very large *Papilio*, *P. homerus*, F., that visits the very small flower of *Aslepias curassavica*; examples of *Libythea*, probably *L. larus*, from Tanganyika territory, congregating perhaps before or during migration; notes on the courtship of *Monomotarpha insignis*, Distant; coprid beetles believed to be internal parasites, and expressed the view that such cases were due to trickery on the part of native medicine men.—Comments were made by the President and Mr. Durrant.—Mr. Donisthorpe exhibited a specimen of *Argynnis euphrosyne* carrying a portion of the pupa case—Some discussion arose as to the effect of damage to antennæ on the flight of butterflies.—Dr. Gahan exhibited examples of the larvæ of *Phytodecta viminialis*, and called attention to the existence in these larvæ of eversible glandular structures between the seventh and eighth dorsal segments.—Comments were made by Mr. C. B. Williams, who said that he found *P. viminialis* to be viviparous.—Mr. Morice exhibited (1) examples of *Anthophora pilipes*, of which he had seen no ♀ ♀, and described attempts made by the ♂ to pair with ♀ ♀ of the Humble Bee; (2) a ♂ sawfly, *Tenthredopsis palmata*, Geoffr., with an abnormal wing neuration, apparently a reversion to a primitive type.—Mr. Talbot, on behalf of Mr. J. J. Joicey, exhibited examples of *Heliconius* from Venezuela.—Dr. Dixie exhibited Pierines from Central Peru.—Comments were made by the President, Prof. Poulton, and Mr. Rosenberg.—Two papers were read (1) by Mr. Donisthorpe on “Mimicry of Ants by other Anthropods,” and the author exhibited a number of examples to illustrate this. Comment was made by Prof. Poulton: (2) By Mr. G. Arrow on “Erotylid Coleoptera.”—H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—Meeting held at the Royal Institution, Colquitt Street, Liverpool, *January 17th*, 1921, the President, Mr. R. Tait, in the Chair.—Mr. Frederick William Holder, 20, Hawesside Street, Southport, was elected a member of the Society.—A discussion on “The Genus *Tæniocampa*,” was opened by the Rev. F. M. B. Carr, who exhibited his collection of this genus in illustration of his remarks. He also showed photographs of the ova of the different species by Mr. A. E. Tonge, Reigate.—The following members took part in the discussion, and exhibited their series of the *Tæniocampidæ*; Mr. S. Gordon Smith, vars. of *T. gothica*.—Mr. W. A. Tyerman, *T. opima*, from Wallasey, selected from a large number bred by himself.—At Eccleston Mere, where nearly all the salallows grow in the water, Dr. J. Cotton had noticed that the moths which fell into the water when the bushes were shaken had no difficulty in swimming to the bank.—The President described several of the best known localities for *Tæniocampidæ*, such as York, Hereford, Lakeside, etc., and remarked on the

tendency of *T. miniosa* to cannibalism when the larvæ were too closely crowded in confinement.—Mr. Tait also exhibited *Asphidia diluta*, *Epunda nigra*, *Polia chi* and *Anchocelis rufina* from Lakeside and *Polia flavicincta* from S. Devon.—Messrs. J. W. Griffin and A. W. Hughes contributed notes on collecting at willow bloom.

Monday, February 21st, 1921.—The President in the Chair.—Mrs. O'Sullivan, 10, Cathedral Mansions, Huskisson Street, Liverpool, and Mr. W. G. Clutton, 136, Coal Clough Lane, Burnley, were elected members of the Society.—The feature of the evening was the competition for the Society's prizes specially offered for the encouragement of field work and observation. A prize of five guineas for the best series of sixty males of *Hybernia defoliaria* first engaged the attention of the judges. So good were the exhibits in this class that it was no easy matter to determine upon the most meritorious; eventually it was decided to award the prize offered for an essay upon the insect fauna of the sand-hills as a second prize in this class, there being no essay entered. The first prize of five guineas was therefore awarded to Mr. Chas. P. Rimmer for his set of the moth from Delamere Forest and Eastham Woods; the second, two guineas, was given to Mr. W. G. Clutton, of Burnley, for a collection made in the neighbourhood of that town. There were some very beautiful forms shown by the competitors, including melanic variations from Burnley. Other exhibitors in this section were: the Rev. F. M. B. Carr (highly commended), Messrs. J. W. and G. A. Griffin and W. A. Tyerman. A prize of five guineas was also awarded for the best six photographs of insects in their natural resting positions selected to show the effect of protective resemblance. In this competition the prize went to Mr. Hugh Main, of London, for a very fine exhibit. These photographs were much admired, particularly the "*Bryophila perla* at rest on sandstone wall," this being an exceptionally fine example of protective resemblance. Prof. R. Newstead, F.R.S., and Messrs. Crabtree and Mansbridge were the judges in the competitions. Other exhibits were insect preparations under the microscope by Mr. Chas. P. Rimmer and long series of early spring Lepidoptera by Mr. S. Gordon Smith; the latter included some nice varieties of *Hybernia leucophaæaria*, *H. marginaria* and *Nyssia hispidaria*; further, the same member showed a fine specimen of *Acherontia atropos* captured near Chester.—WILLIAM MANSBRIDGE, Hon. Secretary.

RECENT LITERATURE.

Annals and Magazine of Tropical Medicine, April 27th, 1921, vol. xv, No. 1. Liverpool.

AMONGST the contents are:

A Scientific Record of the School of Tropical Medicine. By D. Allmand. With 9 plates.

Observations on Mosquitoes in the Isle of Man. By B. Blacklock and H. F. Carter. With 5 plates and a map.

Notes on Some Unusual Breeding Places of *Stegomyia fasciata*, Fabr., in Australia. By G. F. Hill. With 1 plate.

Musca domestica, Linn., as a "Bush Fly" in Australia. By G. F. Hill.

New Tsetse-flies (*Glossina*) from the Belgian Congo. By R. Newstead and A. M. Evans. With 6 good figures.

On a Collection of Pappataci Flies (*Phlebotomus*) from India. By R. Newstead and Major J. A. Sinton. W. J. L.

Insect Pests of Farm, Garden and Orchard. By E. DWIGHT SANDERSON. Second edition, revised and enlarged by LEONARD MARION PEAIRS. Pp. v + 707, with 604 figures in the text. New York: John Wiley & Sons, Inc. London: Chapman & Hall, Ltd., 1921. Price 26s. net.

THE main purpose of this excellent and well-illustrated volume is to enable the farmer, fruit grower, etc., to become acquainted with insect pests in all their stages, and also with the means now employed to control their ravages.

The subject-matter is arranged in chapter form, and in one the "beneficial insects" or those which prey upon and destroy the "injurious insects" are considered. In another chapter the insects affecting man and his home are discussed.

Most of the species referred to in the work belong to genera occurring in Britain, and many are identical species, as, for example, *Sesia tipuliformis* (the currant borer), *Leucania unipuncta* (the army worm), *Laphygma exigua* (beet army worm), and *Heliothis armigera* (the cotton bollworm) among the Lepidoptera.

It has been stated that in the United States insects damage or destroy the produce of farm, orchard and garden to the value of something like one thousand million dollars annually. A capital index greatly facilitates reference to the volume.

Studies on Arthropoda—I. By Dr. H. J. HANSEN. Pp. 8. With 4 copper plates. Gyldendal, 11, Burleigh Street, Covent Garden, London, W.C. 2. 8s. net.

CONTENTS: The Pedipalpi, Ricinulei and Opiliones collected by Mr. Leonardo Fea in Tropical West Africa.

On Stridulation in Crustacea Decapoda.

On the Postembryonic Occurrence of the Median "Dorsal Organ" in Crustacea Malacostracea.

A Book about the Bee. By HERBERT MACE. With 24 illustrations on art paper from photographs by the author. Pp. x + 138. London: Hutchinson & Co. 4s. net.


THE author appears to have a thorough knowledge of his subject, and has given "a plain account of the life and death of the busy occupants of the darksome hive."

To those who are bee-keepers, as well as to others who do not wish to undertake the care of hives, this book should appeal. The story of bee life is pleasantly told in twenty instructive chapters, and the photographic illustrations serve to adorn the tale.

Les Coléoptères d'Europe France et Régions Voisines Anatomie générale: Classification et tableaux génériques illustrés. Par C. HOULBERT. Tome premier avec 104 figures dans le texte et 16 planches. Paris: Librairie Octave Doin, 1921. 10 francs.

EXCHANGE

The publication of Notices of Exchange, or of Advertisements, in the Entomologist is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers, or Advertisers, but to advise the Editor from responsibility, in case the liberty allowed should be abused. *Marked * are bred.*

 NOTICES OF EXCHANGE should be received by the 21st. OF EACH Month to insure insertion. Not more than SIX LINES can be allowed for each

Desiderata. Preserved larvae, many quite common species. *Duplicates.*—Very numerous set Lepidoptera, many bred. *B. S. Hurwood, Melford Road, Sudbury, Suffolk.*

Urgently Wanted.—*Papa:* *Vinula*, *Porcellus*, *Callinae*, *Stellatarum*, *Euclyptus*, *Bifida* and many others. Also living wild-caught females and ova of *Nuptia*. Will give liberal exchange. *L. W. Newman, Boleyn, Kent.*

Desiderata. *Tetropium gabriel*, *E. Crawshayi*, *T. parvum*, *Hypocrepes hagnus*, *M. dorchas unibellatrum*, *Rhagnum indigator*, *Pachyta G. maculata*, *P. collaris*, *Leptura fulva*, *Strangalia aurulenta*, *Ac. anthrenus c. ins.*, *Pogonocherus bidentatus*, *Lama textor*, *Sperdia scalaris*, *Stenostolus terreus*, *Oberia octinata*. *N. C. Rothschild, Palace Green, W. S. London.*

Duplicates. *Solilagus*, *Suspecta*, *Castanea*, *Populata*, *N. rubi*, *Baja*, and many others. *Papa:* *Carmelita*, *Camelina*, *Psi*, *Pennaria*, *Menthastri*, *Libri-capeda*. *Desiderata.* Numerous, especially *Sesidae*, *Sphingae*, *Notodontidae*.—*Thomas Smith, Whiston Eaves, Froghall, Stoke on Trent.*

I am anxious to obtain specimens of the genera *Micropteryx*, *Enocnema*, and *Mnemonea*, and would gladly send Australian Microlepidoptera in exchange. Some of the specimens are needed for dissection, and for this worn or unset examples will be acceptable. *Dr. A. J. Turner, Wickham Terrace, Brisbane, Australia.*

TO CORRESPONDENTS.—All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor—

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDESBURY, N.W. 2.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road). *October 10th and 12th at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1. *Thursday, September 8th, Ordinary Meeting at 7 p.m. Thursday, September 22nd, Lantern Evening at 7 p.m. Hon. Sec., STANLEY EDWARDS, F.L.S., &c., 15, St. Germain's Place, Blackheath, S.E. 3.*

LONDON NATURAL HISTORY SOCIETY, now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings. *Hon. Sec., W. E. GILLOM, 41, Belfast Road, N. 16.*

CONTENTS.

Pieris rapa, Gynandrous ab., *F. W. Fitchawke, F.F.S., M.B.O.U.*, 201. New Species of *Noctua* and *Hypeniga* from the Philippines, *A. E. Wileman and Richard South*, 202. A New Form of *Tajuria* (Lep. Rhop.) from Ceylon, *N. D. Riley*, 206. The Macro-Lepidoptera of County Tyrone, *Thomas Greer* (continued from p. 116), 206. *Oxygraphia Literana*, L.: Its Life-Cycle, Distribution, and Variation, *W. G. Sheldon, F.Z.S., F.E.S.* (continued from p. 190), 209. Notes on the Occurrence of *Anosia Phaeippus* in England, *Paymaster-in-Chief, Gertrude P. Mathew, R.N., F.L.S., F.E.S.*, 210. Notes on British Neuroptera in 1920, *W. J. Lucas, B.A., F.E.S.*, 212. South American Eumelipha. Mostly of the Group *Colaspini*, *Fred C. Howditch* (continued from p. 195), 214.

NOTES AND OBSERVATIONS. Watson's "Species" Binocular Magnifier, *W. G. Sheldon*, 216. Rearing the Larvæ of *Melitæa cinxia*, *C. M. Mayor*, 217. The Adaptation of Caterpillars to their Surroundings, *N. O. R. Seelyard*, 217. Notes of Pupation on *Nonagria typha*, *Thomas Smith*, 218. Second Brood of *Nisoniades* (*Thanaos*) *tages*, *F. W. Fitchawke*, 218. *Nisoniades tages*, Linn., *W. J. Lucas*, 218. Emergence of *Hesperia malva*, *Frederick Gallett*, 218. *Aporia crataegi* L., in Cyprus, *Kenneth Hayward*, 219. *Portesia sumis*, Fues., in Cumberland, *F. H. Day*, 219. *Amphidasya doubledayiaria* in the Isle of Man, *Cyril I. Paton*, 219. *Manduca atropos* on Dartmoor, *S. H. Stidschell*, 219. *Pachetra leucophara* in Bucks, *Walter Pierce*, 219. *Coleophora agraminella* in Essex, *A. Thurnall*, 219. *Platyptilia rhododactylus*, *F. J. C. and F. H. Fryer*, 220. Lepidoptera in the Alton District, *E. L. C. Stoddart*, 220. *Vespa crabo*, *W. J. Lucas*, 221. *Sphæcolyma inanis*, *G. Nicholson*, 221. Material Wanted, *C. Nicholson*, 221.

SOCIETIES. Entomological Society of London, 221. Lancashire and Cheshire Entomological Society, 222.

RECENT LITERATURE. Annals and Magazine of Tropical Medicine, 223. Insect Pests of Garden and Orchard, 224. Studies on Arthropoda, 224. A Book about the Bee, 224. Les Coléoptères d'Europe France et Régions Voisines. Anatomie générale. Classification et Tableaux génériques illustrés, 224.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 25) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918, 1s. 6d. each. Bound Volumes from 1890 to 1914 can be supplied (except 1910 Vol. 33) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s.

CABINETS.

Finest Materials. Best Workmanship.
Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,

12 SPRATT HILL ROAD, HANSTEAD, ESSEX.

Vol. LIV.]

OCTOBER, 1921.

[No. 701.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.	W. J. LUCAS, B.A., F.E.S.
H. ROWLAND BROWN, M.A., F.E.S.	CLAUDE MORLEY, F.E.S., F.Z.S.
W. L. DISTANT, F.E.S., AC.	DR. D. SHARP, F.R.S., F.E.S., AC.
F. W. FROHAWK, F.E.S., M.B.O.U.	N. D. RILEY, F.E.S.
C. J. GAHAN, D.Sc., M.A., F.E.S.	W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made."

LONDON:

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 1

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER,

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera,
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION
36, Strand, London, W.C. 2.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade Wholesale with mixed Colombian Butterflies, first quality, papered, original unpacked collectings; rare and common included. Morpho cypris and Anathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections.
200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

Albert H. Thompson, 54 Church Rd., Northwich
European and Exotic Papered Butterflies
Set to Order in Any Style.

THE ENTOMOLOGIST.

VOL. LIV.]

OCTOBER, 1921.

[No. 701

THE LIFE-CYCLE AND HABITS OF *CYDIA LEGUMINANA*, Z., WITH A NOTE ON ITS SYNONYMY.

By W. G. SHELDON, F.Z.S., F.E.S.

IN the year 1915, as related in vol. xlix, pp. 19-20 of this magazine, I was so fortunate as to meet with specimens of this hitherto very rare species, which had not been recorded for many years, in the Wicken district, and since then I have been engaged at intervals in working out its life-history and habits.

The problem has not been an easy one to solve, largely because I was only able to visit its haunts at intervals, but also because its real larval habits and pabulum were quite unsuspected, and, when ascertained, difficult to follow.

It has generally been assumed that the larva fed, as do several of its supposed near relatives, and as its name would suggest, on the seeds of some leguminous plant, and one persistent student of its habits even relates that he gathered all the seed-pods of the only likely leguminous plant growing in its Epping Forest locality without result. In view of what I have to relate this is not to be wondered at.

As stated in my note (*loc. cit.*), the imago at Wicken frequents hedges of very mixed growth in which I could not find any leguminous plant. I may here say that the last captor who made a record of taking specimens previous to 1915, the late Lord Walsingham, informed me shortly before his death that his examples taken in 1878 occurred in the same hedge as that from which my 1915 captures came.

My first example was beaten out of elm into my net about noon on June 20th, 1915; later the same day I beat or captured flying several others, and during the course of my stay at Wicken of about one week, hard work resulted in my obtaining about fifty specimens.

Almost all these came from the hedge I have mentioned, the bulk of which consisted of the common elm (*Ulmus campestris*), and the moths seemed in some way attached to this tree. In addition to most of the hedge itself being elm, there were numerous elm trees in the hedgerow, some of them were pollarded, and some were trees of large growth forty or fifty feet in height. The insects flew freely and swiftly in the afternoon sun, but as they were small, dark, and inconspicuous, and as, moreover, the hedge swarmed with *Simaethis fabriciana*, which flew with, and

was not easily distinguished from them, at first at any rate, they were not too easy to negotiate. In addition to observing that they were in some way connected with elm, I very soon noticed that almost all my captures were around the pollarded trees, although I could not be certain that they did not equally frequent the tall trees, the tops of which would of course be beyond my vision in the case of such a small object. So impressed was I with this connection with elm that I brought home several females and sleeved them over branches of this tree in the garden here for ova, but the result was *nil*.

I was not able to re-visit Wicken in June until the year 1918, but in that year I spent a fortnight during the latter part of June largely occupied in trying to solve the *leguminana* problem. I found the moths fairly common, and it soon became apparent that the opinion formed on my previous visit of a connection with elm was correct, but what was this connection? It took long and careful observation before I got any nearer. It occurred to me that they might possibly feed in the seeds, but I could not find any seeds, and the few females I met with seemed to frequent mostly the bases of the branches where they joined the trunk, rather than farther out where the seeds might be expected to grow. Eventually I found a very good tree, around which both males and females were common. It was a pollard of course, very rugged, and with a fairly luxuriant growth of ivy growing against its trunk, but not by any means covering it. I thought I had solved the mystery, and that the larvæ fed in the berries of the ivy. A close examination of a large quantity of berries did not, however, reveal any signs of ova, and so that idea was exploded.

Eventually on June 30th I saw a female flying slowly and in a business-like way around an accumulation of dead and dying bark which covered an excrescence in this elm trunk where it had been injured by the axe in cutting off branches years ago. I watched her settle on the excrescence, crawl out of sight underneath a piece of dead bark, emerge and disappear again behind another piece of bark; after she had done this several times I set to work breaking off pieces of dead bark, and with the aid of a lens detected several undoubted tortrix eggs. I felt quite satisfied that I had at last read the riddle. Unfortunately during the next few weeks I was unable to examine these eggs daily. On August 4th I found the larvæ had emerged, but there were no signs of them, and subsequent examinations of the bark were not more successful in detecting larvæ.

In July, 1919, I was again at Wicken, and examination of the excrescences on this and other elm trees resulted in my finding a considerable quantity of red-brown frass, and under pieces of bark several cocoons, which, with the pupa cases attached to them were evidently those of a tortrix. In May, 1920, I made another attempt, and by wrenching off pieces of bark which showed by

the red frass outside traces of larvæ, I succeeded in obtaining a number of pupæ from which in the following month I actually bred five examples of *leguminana*.

The next step was of course to investigate the larva, and at the end of August in the same year I found a number of larvæ which it seemed almost certain must be this species, but I could not succeed in hibernating them; it was therefore necessary to procure another supply in the spring of this year, which I obtained on March 24th; these pupated in due course, and somewhat to my relief, emerged early in June as *Cydia leguminana*. I had felt pretty sure they were this species, but could not be certain, because there is another species, *Phtheochroa schreibersiana*, whose larval habits are somewhat obscure, and which is found in the *leguminana* district. The pupa cases of this species I have actually seen in Hungary sticking out of elm bark.

DESCRIPTION OF OVUM.

The ovum is of the usual tortrix shape, horizontal of course, about .5 mm. long by .33 mm. broad, dull red in colour when deposited on June 30th, 1918; a week afterwards it was light grey and slightly opalescent; the surface was rough and pitted, divided into a large number of small spaces, separated by very fine raised lines; these spaces were irregularly shaped and the dividing lines curved. The divisions were so small and indistinct that they were not discernible in the microscope with a 2-in. lens, but they were distinctly made out by using a 1-in. lens.

On August 4th the larvæ had emerged, probably some time previously.

A larva measured on August 28th, 1920, was then about 8 mm. long and in the last instar; of average stoutness, not attenuated to either extremity. The head was reddish brown and glabrous, the lobes were rather prominent. The prothoracic plate was light brown and glabrous with two darker crescents in front pointing towards the head. The contents of the intestinal canal showing distinctly as a reddish medio-dorsal stripe. The anal plate was dark brown and glabrous; the sub-dorsal and ventral areas, prolegs and claspers were putty coloured and glabrous. The tubercles and spiracles were extremely large and prominent, dark greyish brown in colour. The larva was somewhat spiny; it was fairly active, and on being exposed to the light assiduously sought concealment and darkness. On October 13th I turned out of the tin in which I had kept the larvæ with the pieces of bark on which they fed and found they were all dead and mouldy, although on October 1st I had seen a larva crawling on the glass lid of the tin. On March 24th last I again procured a number of larvæ. Some of these were spun up in compact cocoons formed by the larval frass, and lined with white silk, but some were

crawling about under the dead bark and were not in a cocoon or hibernaculum. These latter, however, in a few days had spun their cocoons.

It should be noted that the season at the end of March, 1921, was fully a fortnight in advance of an average season. These larvæ had not increased in size so far as I could see since the previous autumn, but they had lost their red tint and were greenish white in colour; evidently they had not fed in the spring, for the red tint is caused by the contents of the intestinal canal showing.

The pupa of the male is about 5 mm. long and 1.25 mm. broad, that of the female 7 mm. by 1.5 mm., stout in proportion to its length, light reddish brown in colour, the wing-cases lighter than the thorax and abdominal segments. The whole of the pupa is smooth and glabrous. The wing-cases extend to the rear of the fifth abdominal segment. The abdominal segments have the usual rows of spikelets; there are no anal hooks and the pupa is loose in the cocoon; in the place of anal hooks there are four slightly curved spines. The fourth and fifth abdominal segments are of the same width in the rear as they are in the front; the sixth tapers to the rear; the seventh has a hollow outline and a ridge at the rear; the remainder of the abdominal segments form a funnel-shaped extremity blunt at the anal termination. At the intersection of the abdominal segments are a few short spines pointing rearwards. The head is blunt and rounded without any trace of a cocoon opener; the extremity of the wing-cases forms a slight bulb; the antennæ and eyes project rather noticeably above the wing-cases.

The cocoon is usually attached to the inside of a piece of loose bark and when this is picked off the trunk it generally adheres to it. Two or three days before emergence the markings of the wings show very plainly through the pupal envelope, especially the white dorsal blotch. The first imago emerged on May 30th, 1920, and on June 1st four specimens emerged and their wings were fully developed by 7.45 a.m. Almost all the emergences take place very early in the morning.

Leguminana is to be found everywhere around Wicken that I have investigated amongst pollard elms. It prefers excrescences which have the bark soft; these are usually to be found on the southern and western sides of the trees. In such situations a suitable excrescence will contain from one to several dozens of larvæ, whereas on the other sides where the rain does not often beat against the trunks the swellings would only contain one or two larvæ and in many cases none at all.

When a tree is pollarded there is a tendency to form excrescences where the branches have been cut off; these continue healthy for some years, but the bark gradually dies, and it is upon this dying bark, or rather at the junction of the dead and healthy portions, that the larva feeds.

As I have before stated, the imago flies freely in the sun around the pollard elms during the afternoon; in the morning it is sluggish and can then only be beaten out, and if the weather is cold it is best to beat the elm branches into an umbrella, into which the moth falls and remains quiet.

The imagines are on the wing in an average season from about the end of the first week in June for a month or more, but in the last two seasons, which, of course, were abnormally early, the males especially were flying at the end of May.

One or two continental lepidopterists, judging from what Hoffmann in the Spuler edition (1908, ii, p. 293)—says—"It lives according to Schmidt on *Alnus*, according to Disque in Autumn (November) under the bark of *Fagus*"—seem to have known a fragment of its life-history. I believe there is a good deal of beech growing in the locality in Epping Forest, and it is quite probable that the larva feeds upon this tree as stated by Disque, although his remark would lead one to think that he meant that it hibernated or pupated only under the bark. It is certain that elm is not found nearby, but hornbeam is very abundant, and it is possible, and indeed it appears to me most probable, that the larva then fed upon the bark of this tree. I do not think there are any alder trees to be found there.

The nomenclature of the species is a trifle puzzling. The oldest name that has been applied to it, *lathyra*, Hüb., is a misnomer. His figure (Tort. 207, 1811?), whatever it may have been intended to represent, is certainly not this species. It is most like *Laspeyresia perlepidana*, Haw., and it is generally considered to refer to that species, to which it is assigned by Herrich Schäffer. There can be no question but that the correct name is *leguminana*, Zeller (1846). Herrich Schäffer's name, *deflexana* (fig. 277), is dated 1848; it is stated by him to be a MS. name of Fischer von Röslerstamm, and must fall before that of Zeller. *Interruptana*, Wilk., is another misnomer: he calls it "*interruptana*, H. S.," but this species has nothing to do with *leguminana*, Zell. Herrich Schäffer figures it (fig. 280) as a distinct species from his *deflexana* = *leguminana*, Zell.; it is now known to be the *duplicana* of Zetterstedt. There is still another name, *dorsilunana*, Erschoff, but this is dated 1877—long after Zeller's date.

The first example of *leguminana* taken in Britain is the one in the Doubleday Collection, which is recorded by Wilkinson, Brit. Tort., p. 211 (1859): "A single specimen of this insect is in the cabinet of Mr. H. Doubleday, which was captured several years ago in Devonshire in June." One is strongly inclined to think that this specimen originated very much nearer than Devonshire to Doubleday's residence, *i. e.* in Epping Forest, some three miles from it!

Youlgreave,
South Croydon;
September, 1921.

NEW AND LITTLE KNOWN BRITISH APHIDES.

VI.

BY FRED. V. THEOBALD, M.A.

Anuraphis centauriella, nov. sp.

Alate viviparous female.—Head and thorax brownish black; abdomen pinkish brown, pinkish ochreous or pinkish green, with black transverse markings in the form of a black blotch on the posterior two-thirds of the abdomen and a row of black spots at the sides. Cornicles brown. Legs light brown, with the femora, apex of tibiæ and the tarsi dark brown. Antennæ dark brown; shorter than body; basal segment a little wider, but no longer than second; third nearly twice as long as the fourth, with 35–50 round sensoria over its whole length; fourth larger than fifth, with 10–12 sensoria; fifth with only one round subapical one; sixth as long as 4 and 5, basal area about half the length of flagellum in one specimen, in others one-third of the length. Proboscis reaching nearly to third coxæ. Cauda and anal plate deep brown, the former bluntly triangulated, with a few hairs; the latter also with a few hairs; cauda about as long but wider than cornicles. Cornicles cylindrical, somewhat contracted at apex, which is flanged. Wings normal.

Length, 1.5–1.7 mm.

Apterous viviparous female.—Dingy pale green, tinged in parts with pale pink. Legs and antennæ pale ochreous brown. Cornicles and cauda pale brown. Front of head pale brown, sometimes suffused with pink. Eyes dark brown. Antennæ about one-third the length of the body; of five segments, the basal one wider but no longer than second; third as long as fifth; fourth small, about one-third of third; fifth with flagellum a little longer than base, the latter longer than fourth. Cauda broad and blunt, about as long as the cornicles; anal plate rounded, both with a few hairs. Cornicles short, conical. Legs rather short.

Length, 1.2 mm.

Nymph.—Pale clear green; head, wing buds and legs brown. Eyes dark brown. Cornicles same colour as body, tipped with pale brown. Antennæ of six segments.

Food plant.—Knapweed (*Centaurea nigra*).

Locality.—Inverness-shire, N.B. (7. ix. 20) (D. J. Jackson Coll.).

Observations.—Described from several alate females and one apterous female. The coloration is very marked. The notes were taken by Miss Jackson from living specimens. She found this insect amongst colonies of *Macrosiphum jaceæ*, Linnæus, clustered near the flower-heads. The majority were alate

females and nymphæ. One apterous female occurs on one slide, but I do not think is mature. The antennæ have only five segments. This species is quite distinct from any *Anuraphis* I know of.

Thripsaphis cyperi, Walker.

Oviparous female.—Apterous. Light brown, the anterior portion of the body frequently lighter and more of a greenish brown; the divisions of the segments all yellow, with their margins less defined on the sides, where the yellow area is wider on each segment; the segmental divisions are also marked with dark lineal streaks. Cornicles as small yellow pores. Apex of body tipped with brown. Antennæ blackish brown. Legs brown. Eyes dark red. Venter yellow. Body with a few very short hairs, only seen under the microscope. Usually a pale undefined line in the middle of the anterior segments. Antennæ of six segments; from a little under to a little over half the length of the body; basal segment much larger than second; third longer than fourth; fourth about half the length of third and equal to the fifth, the latter with a small pale subapical sensorium; sixth longer than fifth, the basal area nearly as long as the flagellum. Eyes large, no ocular process. Proboscis thick, not quite reaching to the second coxæ. Legs thick and rather short; hind tibiæ with many pale sensoria, not quite reaching to the apex. Cauda somewhat quadrangular at the swollen extremity, with a few short hairs. Anal plate retracted, bilobed, with a few short hairs.

Length, 1.8 to 2 mm.

Larval oviparous female.—Smaller and browner than mature female. Yellow, with brown areas and brown spots and dots. Cornicles as yellow pores, in centre of a brown spot. Legs and antennæ brown. Like the adult covered completely with white tomentum. The antennæ more than half the length of body; basal segment larger than second; third nearly twice as long as fourth; fourth and fifth equal; sixth longer than fifth; basal area longer than flagellum. Proboscis very broad, reaching just past second coxæ. Legs short and thick; tibiæ with a few short stiff hairs. Cauda triangulate at knobbed end.

Apterous viviparous female.—Elongate and more Thrip-like than the oviparous female. Antennæ about half the length of the body, proportions same as in oviparous female. Proboscis reaching just to the second coxæ. Cauda markedly knobbed, the apex rounded. Anal plate bilobed, lobes widely separate, with a few bristles. Hind tibiæ narrow, narrower than the fore and the mid, all with numerous short hairs; one marked chæta on each small first tarsal segment, shorter ones on the second tarsals. Cornicles rather more raised than in the oviparous females.

Length, 2 mm.

Food plant.—*Carex goodenovii*, L. Gray.

Locality.—Kyle, N.B. (D. J. Jackson).

Observations.—Described from specimens taken by Miss Dorothy Jackson on rushes on marshy ground. They are, she says, “extraordinary aphides, found usually singly resting on the tips of the leaves. They were quite conspicuous, being covered with greyish-white tomentum. The moment the grass was touched they dropped off.” The small lineal ova were also found on the leaves covered with whitish-grey tomentum. The Thrips-like appearance of the insects is very marked. From Laing’s redescription (*‘Ent. Mo. Mag.’* lvii, 120, 1921) of Walker’s *Aphis cyperi* it appears that this is the oviparous stage of that insect, although, as Mr. Laing kindly writes me, there are certain minor differences, such as size, slightly different antennal proportions, and absence of sensoria on segment iii of the antennæ; all of which are quite likely in the oviparous stage.

Pterocomma jacksoni, nov. sp.

Apterous viviparous female.—Variegated in colour, ground-colour pinkish-brown, but median area of the abdomen pale greenish, merging into pink in region of the cornicles; a pale dorsal line commences on the mesothorax and is continued to the cauda. On the sides of the thoracic segments are blotches of very dark green; these are continued on the three median abdominal segments, interrupted on the segment in line with the cornicles and then continued as darker green patches to the end of the body. Some specimens are unicolorous pinkish-brown. Legs ochreous, with apex of femora and tibiæ and all the tarsi brown; in hind legs all the tibiæ are brown. Proboscis long, ochreous, apex brown. Antennæ ochreous, with basal segments brownish and apex dusky. Cornicles ochreous, in some bright orange. Venter uniformly yellowish or pinkish yellow, with a brown spot at apex of abdomen. Eyes black. Body, especially venter, dusted with tomentum. Hairs on legs rather close and sloping towards the apex (not more or less erect as in *populeus*). Antennæ about half the length of the body, with long, rather dense hairs; basal segment a little longer than second; third the longest, with 7–9 round sensoria on the basal three-fourths; fourth segment about as long as fifth, the latter with the usual sub-apical sensorium; sixth a little longer than fifth, its basal area not quite so long as the flagellum, the basal area has many fine long hairs like the others; proboscis reaching to third coxæ. On the pronotum a marked papilla on each side, normally *truncate*. Body very hairy. Legs very hairy, fore pair rather short and thick; mid longer; the hind with very long and densely hairy tibiæ. Cauda and anal plate very hairy, the latter rounded and the former longer and narrower, but rounded. Cornicles about as long as fifth antennal segment, narrowed at base, slightly swollen near apex, where it is constricted; apex flanged; nearly twice as long as hind tarsi. There is a small pale crenulated membrane on the inner side of the femoro-tibial joint. The immature forms show abdominal lateral papillæ and have no antennal sensoria and shorter legs.

Length, 3 mm.

Food plant.—Goat Willow (*Salix caprea*).

Locality.—Inveran, Invershin, N.B. (8 . ix . 20) (D. J. Jackson Coll.).

Observations.—Described from mounted specimens and live colour notes sent me by Miss D. J. Jackson, who found this insect thickly clustering along the branches of a goat willow growing in a birch wood, in company with *P. populeus*. It was closely attended by ants (*Formica rufa*), that had many nests in the locality. The Aphides harmonised closely with the colour of the branches. This species closely resembles *populeus*, but the antennæ of the apterous female carry marked round sensoria, and the hairs of the legs are much closer and slope towards the apex of the leg, whilst in *populeus* (*pilosa*) they are further apart and more erect. The prothoracic papillæ are very marked, being truncate, but in one specimen one papilla is rounded apically, the other being markedly flattened at the apex.

Pterocomma fraxini, nov. sp.

Apterous viviparous female.—Dull reddish-brown, with dark median and lateral patches, from which very small tubercles arise and also on the pronotum. Antennæ reaching just past the third pair of legs; two basal segments dark; third and fourth pale, dusky at apices; fifth and sixth dark; basal segment larger than second; third about twice as long as fourth, which is about equal to fifth; sixth with flagellum twice as long as basal area (unlike *P. populeus*); hairs long, fairly numerous, but not so much so as in *populeus*, pale on third segment, darker elsewhere; sensoria on fifth and sixth normal. Cornicles projecting and about as long as fifth segment, nearly twice as long as the hind tarsals, swollen apically on one side and constricted near or at apex; dull yellowish, dusky at apex. Cauda dark, rounded; anal plate paler, both hairy. Legs pale to deep yellowish-brown, fore and mid femora and tibiæ thick, apices of tibiæ broad and truncate; tarsi narrow; apex of tibiæ dark. Antennæ, body and legs very hairy.

Length, 3.9 mm.

Locality.—Wye (3 . vi . 11).

Observations.—Described from a single colony found on the petiole of an ash leaf (*Fraxinus excelsior*). It is more robust than *Pterocomma populeus*, from which it also differs in (1) the longer and larger cornicles and (2) the long flagellum to the sixth antennal segment. It most nearly approaches *P. bicolor* of Oestlund, but the cauda is not broadly angulated. The thick legs are very characteristic.

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE
GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 216.)

Rhabdopterus grenadensis, sp. nov.

Form of *piceipes*; body below dark brown, feet lighter, with darker knees; above uniform bronzed, head and thorax sparsely punctured, especially the latter at the middle; elytra more coarsely punctate, seriate on the disc and apex, and costate at the latter. Hind tibia of ♂ without sinuation.

Type, 2 ♂, 8 ♀, St. Vincent, Grenada.

Length, 4.5–5.5 mm.

Head with the usual cross and longitudinal impressions rather obsolete, the sparse punctures less evident at the vertex. Antennæ rather stout; joints 7 and 11 noticeably dark, those between more or less piceous; thorax with rounded sides, obsoletely subangulate at the middle. Elytra with usual depression within and below the shoulder feebly indicated, obsoletely so in the ♀. Punctuation is coarse and at sides confluent, forming rugæ; the last ventral segment in the ♀ is emarginate, without teeth; the edges of the thorax and elytra are narrowly metallic. As compared with *piceipes*; the punctuation of the thorax is much sparser and that of the elytra much coarser, the colour of the antennæ differs, and the hind tibia of the ♂ and ventral of the ♀ are simple.

Rhabdopterus blatchleyi, sp. nov.

Larger than *piceipes*; below, dark chestnut brown, with somewhat lighter legs; above, bronzy brown, the thoracic and elytral edges and the punctures all more or less metallic green, the hind tibia of the ♂ strongly dilated for its apical half, last ventral of ♀ tridentate.

Type, 5 ♂, 5 ♀, Dunedin, Fla. (Blatchley); also 1 ♂, Charleston, 1858 (J. Gray). The Blatchley specimens are all more or less broken as to legs and antennæ.

Head with smooth antennal calli and light depressions; punctuation moderate, more crowded in front; antennæ with joints 7, 10 and 11 dark; thorax finely and nearly evenly punctate, sides rounded, subangulate at the middle. Elytra obsoletely depressed within and below the shoulder, thickly punctured (much coarser than the thorax), subseriate on the disc, with smooth intervals behind in the form of obsolete costæ. As compared with *piceipes*, the thoracic punctuation is much closer and more even, the general form is usually larger and the

♂ tibia very different. Sent me by Mr. Blatchley as *piceipes*, but not agreeing with the northern form, and certainly not agreeing with Dr. Horn's remarks, 'Trans. Am. Ent. Soc.,' vol. xix, p. 227—"tibia slightly sinuate in the inner edge." It seems to me probable, however, that this is the form described by Olivier as *piceipes*.

Still another form is indicated in the Blatchley material by one ♂, two ♀, rather more elongate and parallel, with simple hind tibia in ♂. I hesitate to describe it until all the forms can be brought together with a larger material.

Rhabdopterus similis, sp. nov.

Small, stout. Below with legs dark brown; breast and legs tinged with æneous; above entirely greenish, bronzed æneous, shining; antennæ rufous with the last five joints fuscous.

Type, 2 ♂, 2 ♀, Cochabamba, Boliv. (Germ.).

Length, 4 mm.

Head thickly and strongly punctate, a little more crowded on the epistome, a fairly well-marked transverse groove but no longitudinal; labrum square, rufous; thorax transverse, subangulate at the middle, thickly punctate, more or less crowded at sides, punctures finer than the head, sides with a faint median depression; elytra with well-marked, but short, cross depression below the shoulder, very finely punctate striate, obsoletely costate at the tip and sides; the thoracic and elytral margins are narrowly brilliant metallic green, but not particularly noticeable on account of the general colour. In general aspect resembles *apicicornis*, Jac., as identified by me, lacking, however, the thoracic angulation.

Rhabdopterus angulicollis, sp. nov.

Medium sized, stout. Below, with legs, entirely rufous; antennæ rufous, joints 7, 8 and 11 fuscous; head rufous, slightly iridescent in certain lights; thorax and elytra brilliant green bronze, dominating a rufous under-colour; thorax transverse, noticeably angulate back of the middle and with a strongly-reflexed margin.

Type, ♀, Salinas, Beni R., July, 1895, Stuart.

Length, 4.5 mm.

Head finely punctulate, with a well-marked frontal fovea; labrum rather deeply notched; thorax slightly collared in front, moderately punctate with mixed punctures, with small smooth areas before and behind at the middle, and a slight lateral depression in line with the angulation. Elytra with moderate cross-depression, the whole surface strongly punctate striate on the disc and next the suture, confused at the side, forming transverse rugæ; intervals subcostate at the apex. This form is allied to *semifulvus*, Jac., and seems to be the largest of the forms with

angulate thorax as described by Mr. Jacoby. The angulation as well as colour easily indicate this form.

Rhabdopterus tarsata, sp. nov.

Medium, stout. Below dark brown, or piceous æneous; apex of abdomen rufous; legs rufous, with apex of tibia and tarsi dark cyaneous; body above shining, chestnut brown, overlaid with greenish æneous; antennæ rufous, with joints 7, 8, 10 and 11 dark.

Type, ♂, Mecas, Ecuador.

Length, 4 mm.

Head finely and rather sparsely punctulate, with well-marked transverse and longitudinal impressions; thorax obsoletely collared in front, sparsely, unevenly, mixed punctulate; elytra with obsolete transverse depression coarsely punctate, semiseriate on the disc, subcostate at the base and strongly costate at the apex, more or less rugose at the sides; thorax and elytra with narrow reflexed margins, these and the punctures obsoletely metallic green.

Rhabdopterus aciculatus, sp. nov.

Large, stout. Below with legs very dark brown; breast and thighs tinged with æneous; above shining bronze; thorax irregularly, but at sides closely, aciculate punctate; elytra strongly punctate; disc seriate, intervals at the sides and apex strongly costate.

Type, ♀, Rio Madeira, Brazil (Mann and Baker).

Length, 6 mm.

Head with transverse and longitudinal grooves, rather closely punctate, especially on the epistome, and becoming strigose at the vertex and back of the eyes; labrum rufous, antennæ rufous, becoming fuscous at the tip; thorax transverse, sides rounded, margined, narrowed as usual at the front, but not distinctly angulate; an irregular smooth area on the middle disc and in front; punctures larger and more crowded at sides. Elytra with transverse depression below the shoulder. The sides have four or five well-defined costæ from the shoulder to apex; the latter is entirely and regularly costate striate with the intervals finely alutaceous; the tip of the abdomen is rufous, punctate, and broadly emarginate.

This is one of the undetermined forms of the Stanford Expedition to Brazil spoken of in 'Psyche,' vol. xx, p. 125.

(To be continued.)

FOUR NEW MOTHS FROM THE PHILIPPINES.

BY A. E. WILEMAN AND RICHARD SOUTH.

Characoma (?) *albisecta*, sp. n.

♀. Head and thorax white, marked with black; abdomen grey, darker towards tip. Fore wings greyish-brown clouded with blackish on costal area, traversed by black irregular lines; basal line white, short, connected by a white streak with the antemedial line, which is also white and bluntly serrate; medial line white, bidentate; post-medial line white, not reaching the costa; all three lines interrupted below the median nervure and represented by white marks on dorsum; subterminal line black, outwardly edged with white, sinuous towards costa, crenulate towards dorsum; three white marks between end of the cell and apex of the wing; a grey patch on tornal area. Fringes grey-brown marked with white, a black dotted line at base. Hind wings greyish, becoming blackish on terminal area. Underside of fore wings dark fuscous, white-marked on apical half of costa; of hind wings greyish, darker on margins.

Expanse, 30 mm.

A female specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.), November 8th, 1912.

Amyna (?) *indigata*, sp. n.

♀. Head, thorax and abdomen brown. Fore wings brown, reniform stigma partly outlined in white, a short white streak from costa before apex, four white dots on costa, the largest above reniform; sub-basal and antemedial lines whitish, crenulate, the sub-basal inwardly edged with black, both obscure but more distinct on costal area; postmedial line black, crenulate, excurved from costa to below middle thence incurved to dorsum, followed towards costa by pale brown marks between the veins; subterminal line darker brown, crenulate; white dots at terminal ends of veins. Hind wings brown with traces of a darker postmedial line, most distinct and pale-edged towards dorsum; terminal line pale brown. Underside greyish, fore wings brownish suffused, with curved, blackish, postmedial and diffuse subterminal lines; hind wings freckled with brownish, discal dot black, crenulate, postmedial line dark brown.

Expanse 30 mm.

A female specimen from Manila, prov. Rizal, Luzon (sea level), July 11th, 1912.

Except that it is larger this species seems to be near *A. crocosticta*, Hampson.

Habrosyne costalis, sp. n.

♂. Head and thorax brown, marked with darker; abdomen grey-brown tipped with darker. Fore wing brown slightly tinged with olive, costal area between antemedial and postmedial lines whitish clouded with brown; a short oblique silver streak on basal area;

reniform stigma partly outlined in white; antemedial line silvery white, oblique, interrupted, most distinct towards costa, less in evidence towards dorsum; postmedial line black, wavy, nearing the antemedial toward dorsum, followed by a shade of brown below middle; subterminal line undulate, indistinct, inwardly edged with white towards apex and faintly towards dorsum; black lunules edged with white on termen; fringes grey, paler at ends of the veins. Underside fuscous, paler on costa and termen of fore wings and on termen of hind wings.

Expanse 50 mm.

A male specimen from Haight's Place, Pauai, subprov. Benguet, Luzon (7000 ft.).

Comes near *H. dieckmanni*, Staudinger.

Ozola pica, sp. n.

♂. Head and thorax yellow with black dots; abdomen paler yellow, barred with black. Fore wing white on basal two-thirds, apical third and costal margin to base black, base of wing yellow, a curved series of black dots at one-third from the base; four white spots in the black apical third—three parallel with termen, and one at two-thirds from base. Hind wings white, a black band on terminal area, the outer edge of which is irregular. Fringes of all wings grey, termen black. Underside as above.

Expanse 40 mm.

One specimen from Palali, sub-prov. Benguet, Luzon (2000 ft.), December 26th, 1912.

Comes near *falcipennis*, Moore.

NOTES AND OBSERVATIONS.

ARCTIA CAIA UTAHENSIS, HY. EDW.—I have just received a specimen of this form from Steamboat Springs, Colorado (Orman M. Strange), and on looking up the literature find that Hampson's diagnosis ('Cat. Lep. Phal.' vol. iii) is not quite exact. The hind wings and abdomen are orange, or rather orange-fulvous, the abdomen becoming scarlet basally. As Henry Edwards stated, the bands on the primaries are wider than in the *americana* form. Holland ('Moth Book,' pl. xv.) figured this as *wiskotti*, Staudinger, but the true *wiskotti* is not American, though it appears to represent an independent development along similar lines.—T. D. A. COCKERELL.

PYRAMEIS GONERILLA IN NEW ZEALAND.—Having read various more or less interesting notes on *P. atalanta*, from time to time, in the 'Entomologist,' I thought perhaps something about its representative in the Antipodes might be of some interest too. This species is said to be dying out, and as far as the northern portions on the North Island are concerned, there seemed to be a good deal of truth in the

statement. However in the south I saw no signs of such being the case. From what I could gather, this butterfly in the neighbourhood of Wellington and elsewhere seems to be on the wing practically all the year round, but far most abundant in the summer and early autumn. I arrived in Wellington about mid-November where I found the spring extremely cold, but all the same it was not long before I had secured a good number of *gonerilla* larvæ, some from the dwarf nettles which grew somewhat sparingly in certain damp situations in some native bush, near Karori (by following the instructions of Mr. H. W. Simmonds), and others on the bush-nettle, a huge, thick plant, which, thanks to information received from Prof. Kirk, of Wellington, I found quite a lot of, down in one gully, near a stream, below some "sheep-trimmed downs." The bush-nettle (*U. ferox*) is a very large member of the *Urticæ* family; its sting is so formidable as to cause intense numbness to the fingers for several days afterwards. It is being destroyed everywhere as a useless pest, and hence, I suppose, the said diminution in the numbers of *P. gonerilla*, though it is nowhere near extinction at present. The larva varies very considerably; some were nearly black, others almost entirely of a deep cream colour; then again a pale dull green hue was in preponderance, in some cases extremely so, with every intermediate form of it. I also found the pupa, on several occasions, rolled up in the nettle-leaves. The butterflies began to emerge in December, and all I had were out before the middle of January. I bred some dozens of them and could have secured as many more had I wished to. The place where I saw most wild specimens on the wing was Wanganui (in the south part of the North Island) late in January. Here on the banks of the Wanganui River, where *Buddleia* grew in great abundance, on the mauve blossoms of this attractive plant, *gonerilla* was much in evidence; whereas of the other *Vanessa* (*V. itea*), said to be partly accountable for the possible extermination of the former, I saw scarcely a single specimen. I do not know if *Buddleia* is indigenous to New Zealand, or has been imported thither from the old country, but if this is so, I can only say that, like many other imported things, it is doing mighty well in the south hemisphere. Many things which flourish there have been imported, some to the subsequent annoyance of the New Zealander. For instance, the humble bee was found to be a necessary influence in the fertilisation of clover, and was duly imported, with the results that the clover seeds alright, but the bee attacks beans, and riddles holes in them at a certain period of their development, thus causing an immense amount of destruction to the crops. Sparrows are everywhere, and skylarks fill the skies with their songs—in fact, if I am here in the spring, I need only go out into the meadows of England, close my eyes, and feel myself back in New Zealand. Another importation which has flourished amazingly in its new surroundings is the common blackberry; one could almost live on them in the neighbourhood of Nelson. I have never seen such quantities anywhere in Europe, and in size and flavour they were equal to, if not surpassing, the cultivated blackberries of California.—MARGARET E. FOUNTAINE, F.E.S., 126, Lexham Gardens, London, W. 8, September 7th, 1921.

THE LARVÆ OF *INO GLOBULARIÆ*.—Buckler's figures and description do not agree with British specimens. I am indebted to the kindness of Mr. F. G. S. Bramwell for a supply of the larvæ of this extremely local moth, and also for pointing out that Buckler's figures and description do not agree with British examples of the larva. The difference is so great that I am inclined to think Buckler, who obtained his larvæ from continental sources, must have had some other species. When the actual British larvæ are placed before the figures the difference is very striking, the figures having a bluish-green tint, whilst the actual larvæ are without any trace of blue; there is certainly some green, but it is brownish green. The details given by Buckler also do not seem to correspond with those of the larvæ I have seen. The specimens handed to me by Mr. Bramwell came from Hollingbury, near Brighton. The following are the chief points of difference:

As Described by Buckler.

1. Prothorax "greenish with broad black marking or plate tapering towards the front."
2. "Tubercles rather light bluish green."
3. "The dorsal row of markings black."
4. "White sub-dorsal marking; inclines to creamy white, sometimes to yellowish white; this is contrasted strongly below by a broadish stripe of dark green, tapering towards the head."
5. "On the smooth skin are minute black dots."
6. "The side below is entirely dark green."

Hollingbury Larvæ.

1. Prothorax brownish with dark brown marking tapering to front, and some small black dots.
2. Tubercles light brownish grey or putty coloured.
3. Dorsal row of markings dark grey with lighter margins.
4. This stripe is dark putty coloured.
5. I cannot see any signs of these.
6. The side below is dark putty coloured.

It is very difficult to follow Buckler's description, and the above notes must not be taken as an ideal method, but simply as an attempt to indicate the main points of difference. Mr. Bramwell informs me that the larvæ from the Lewes locality are even more different from Buckler's description than those from Hollingbury, and that they are darker in shade than the latter, with dull flesh colour in the spiracular areas and on the claspers.—W. G. SHELDON.

NOTES ON SECOND AND THIRD BROODS, 1921.—With reference to the note on *Nisoniades tages*, second brood, seen by Mr. W. J. Lucas in the New Forest this year (*antea*, p. 218), I should like to add that I took a freshly-emerged specimen of the above on July 13th last also in the New Forest, which doubtless belonged to a second brood, and which, as noted by Mr. F. W. Frohawk (p. 218), was much more spotted and suffused with cream colour than any I have yet seen. I took third-brood *Polyommatus icarus* between August 27th and September 3rd in perfect condition, and doubtless freshly emerged, including a nice blue female var. *cærulea*, all from one locality near here (Mortlake). The second brood of *Celastrina argiolus* was abundant here during July, and I took several specimens of same, it being specially fond of a small blue flower growing up the wall of a house and also bramble blossom. The spring brood was decidedly

scarce here. The third brood of *Chrysophanus phlæas* was out and extremely abundant on August 27th. One could net a hundred or so in quite a short time, var. *cæruleo-punctata* being quite 30 per cent. of those examined. I took an example of *C. phlæas* with hind wings of a uniform fawn colour and the copper band very thin. With the exception of *N. tages*, all the specimens mentioned were either seen or taken by me within a short walk of my house.—A. E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

SECOND EMERGENCE OF *HESPERIA MALVÆ*.—A specimen of this butterfly was captured here on September 6th this year.—N. C. ROTHSCHILD; Ashton Wold, Oundle, Northamptonshire.

NISONIADES TAGES, SECOND BROOD.—With regard to the occurrence of a second brood of *Nisoniades tages* during the present season, to which reference was made by Mr. Frohawk and another in the September 'Entomologist,' I have to report that I saw a single specimen on July 19th. On July 30th I took one in battered condition, and again single specimens on August 3rd and August 19th. The one taken on the last date was quite normal and in fresh condition, but the one taken on August 3rd was remarkable owing to its uniformly pale brown colour, which is almost identical in shade to that of the under-side of individuals of the spring brood. The whitish spots on the upper side of the hind wings are very conspicuous, and the under-side much paler than in typical specimens. Unfortunately it is damaged. All were taken in this neighbourhood.—CHARLES M. WOODFORD; The Grinstead, Partridge Green, Sussex.

SECOND BROOD OF *NISONIADES TAGES*.—On July 30th *Nisoniades tages* was common in fresh condition between Bembridge and Sandown. The species occurred up to August 28th—the last date when I had the opportunity of looking for it.—F. W. J. JACKSON; The Pines, Ashted.

NISONIADES TAGES, SECOND BROOD.—While searching for varieties of *Polyommatus bellargus* on the upper slopes of the Verne Fort, I. of Portland, I took two freshly-emerged specimens of *Nisoniades tages*. This was on August 21st, and several more were observed on the following day.—F. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

POLYOMMATUS BELLARGUS AT PORTLAND.—This species is very common on the steep slopes of the Verne Fort. The first specimens—males—were seen on August 14th; two days later hundreds of both sexes were flying there. The only aberration worth remark was ab. *puncta*, with very conspicuous black dots on the margin of the hind wings; several such specimens were taken. The species was also taken on the top of the cliffs near the lighthouse.—F. J. KILLINGTON; 1, St. Catherine's Road, Eastleigh.

COLIAS HYALE AND *PYRAMEIS CARDUI* IN ESSEX.—On September 8th I captured a worn specimen of *Colias hyale*, ♀, flying over a field of lucerne in bloom on Canvey Island, the only specimen seen, which

died a few days after without depositing. Upon examination she had already done so previous to capture, as only a very few ova were found in her body. *Pyrameis cardui* was fairly numerous, feeding on the lucerne blossoms; some in fresh condition, probably bred in the neighbourhood.—F. W. FROHAWK; September, 1921.

COLIAS HYALE AT HAZELEIGH.—This is evidently not a *Colias* year in this neighbourhood. My wanderings in August through the many lucerne fields close by were altogether futile until, on the last day of the month, I came across a freshly-emerged specimen of *C. hyale*. *C. croceus (edusa)* I haven't seen at all, and, as most of the lucerne is now cut, I can hardly hope for any further success this year.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, September 7th, 1921.

COLIAS HYALE IN SUSSEX.—I caught a specimen of *Colias hyale* on July 29th last near Pulborough, Sussex. This seems to be an interesting date.—G. H. SIMPSON-HAYWARD; Icomb Place, Stow-on-the-Wold.

COLIAS EDUSA AND CARADRINA AMBIGUA IN SOUTH DEVON.—The greater part of August was spent by me at Budleigh-Salterton. While there I saw about half-a-dozen specimens of *C. edusa*. Since coming home I have been up in the Portsdown Hills, where the species was common last year and in 1917, but did not see a single example. I believe that in most years a few specimens are seen at different spots on the South Devon coast, which looks as though in that favoured part of the country the species survived the winter. In the garden of the house where I was staying at Budleigh Salterton was a large *Buddleia*, and each night among a number of commoner things I took specimens of *Caradrina ambigua* flying around or settled at the flowers.—J. E. TARBAT; Fareham, Hants.

CHRYSOPHANUS PHLEAS SCHMIDTII.—On August 6th I took a specimen of *C. phleas* ab. *schmidtii* on Sheen Common, Richmond. The ground-colour of fore wings and the band on hind wings is creamy, not white, and the band is slightly suffused with orange. I think it is referable to the form mentioned in 'Butterflies of the British Isles.' The second brood of *C. phleas* was abundant on the common, and a third emerged about the last week in August.—S. B. HODGSON; 3, Bassett Road, North Kensington, London, W.

CELASTRINA ARGIOLUS TREBLE-BROODED.—On Sunday last (September 4th) I noticed two *C. argiolus* gambolling in the air just outside my house, and have seen several specimens flitting about the ivy since that day. As the second brood was out about July 20th these individuals evidently belong to a third brood. The only previous record I have of such an occurrence is in 1911, when September was gloriously hot.—(Rev.) GILBERT H. RAYNER; Hazeleigh Rectory, Maldon, September 7th, 1921.

CÆNONYMPHA PAMPHILUS VARS.—Whilst collecting specimens of the above near here last month I took two which were different from

the type—one with a “blind” eye spot at the anal angle of each of the hind wings, and the other with four spots or points along the outer area of the hind wings, the points being very small. Can any reader tell me of similar vars. having occurred anywhere?—AUGUSTUS E. STAFFORD; 98, Cowley Road, Mortlake, S.W. 14.

BRENTHIS SELENE, SECOND BROOD, AGAIN AT ABBOTTS WOOD.—I recorded the appearance of a numerous second brood of *Brenthis selene* in 1920 on p. 18 of the present volume. A note on a similar brood this season may be of interest. It was first seen on July 24th, when my friend, Mr. F. P. Sharp, of Eastbourne, took four. On the 31st he took some fifty during a very short visit. My first visit was paid on August 7th, when about fifty were inspected between 9 a.m. and noon; they were then showing signs of wear. On the 8th and 10th the weather was unfavourable and I saw but few, and those worn, but on the 14th in a couple of hours in the early morning between fifty and sixty were examined, a good few of which had but recently emerged. As in 1920 a careful search in other parts of the wood where they had been common in May revealed no signs of them. Both years had very early springs (*selene* in 1920, May 23rd, in 1921, May 21st) and sharp frosts in June, which cut down the bracken in the more exposed parts of the woods. Mr. Sharp has suggested to me that these conditions (1920 being the very reverse of 1921 in other respects) might afford an explanation of what is certainly, so far as records go, a most unusual occurrence. To accept this theory support should be forthcoming in the shape of similar records from other localities for *both* years. Perhaps some of the readers of this note may be able to give the necessary evidence. Did any of the Lewes collectors find a summer brood on the “*Immorata* ground”?—H. WORSLEY WOOD; 31, Agate Road, Hammersmith, W. 6, September 13th, 1921.

POLYGONIA C-ALBUM IN WARWICKSHIRE.—On September 3rd I saw in my garden here a perfect specimen of *Polygonia c-album*. It was easily captured while revelling in the sweets of a decayed apple on the ground. We are not far from the well-known haunts of this pretty species in Hereford and Worcestershire, so it is natural that an occasional specimen should wander into Warwickshire, but I have not heard of it in our county before.—E. GROSE HODGE; The Rectory, Birmingham.

POLYGONIA C-ALBUM IN BERKSHIRE.—I took a specimen of *P. c-album* in Wittenham Wood, Berks, on July 12th last. I have never seen or heard of a specimen from this locality before.—MORRIS J. BOORNE; “The Crossways,” Shillingford, Wallingford.

VANESSA ANTIOPA IN DORSET.—On Tuesday, August 23rd, I noticed a butterfly sitting on a half-eaten apple in the garden and feeding voraciously. Not being quite sure what it was I went to look in a butterfly book, and found it was a Camberwell Beauty. It had gone when I returned, but two days afterwards I found it in the greenhouse, dashing itself against the glass. With the help of a gardener

I caught it in a glass shade, and it was killed and set. I should be much interested to know if many of these butterflies have been seen this year in other parts of the country.—MARY C. BOND; Tyneham, Corfe Castle, Dorset.

[Besides the specimen now recorded by Mrs. Bond, captured on August 23rd last, according to records available, it appears only three other captures have occurred of *Antiopa* during the past 44 years in Dorset, viz., one at Branksome in 1877, one at Weymouth in 1884, and one at Swanage in 1918.—F. W. F.]

PAPILIO BIANOR TAKEN AT BRIGHTON.—This butterfly was caught in a net on June 8th, 1918, by Mrs. Chart, flying over a bed of pansies. I have seen the insect, it is a little rubbed, having been carried alive to a firm of naturalists (Messrs. Pratt & Sons) at Brighton, who killed it and set it up in a case. It is an inhabitant of China and Hong-Kong, and resembles ab. *majalis*, the rarer spring type, the blue lines on the lower wings extending to the base of the rounded tails as in ab. *japonica* (Butl.) and *maacki* (Ménétr.). How it came to be flying at Withdean, Brighton, is a mystery.—F. G. S. BRAMWELL; 1, Dyke Road Drive, Brighton.

LAMPIDES BÆTICUS AT DOVER.—A friend of mine here showed me a specimen of *Lampides bæticus* taken in his garden. It is a good female specimen. I send you his letter.—G. O. SLOPER; Hotel Burlington, Dover.

Extract from Mr. F. P. Lane's letter.

"The 'Tailed blue' which I showed you on Saturday was caught by my son (Fredk. E. Lane, aged 13) in my garden at the back of Montague Gardens, Castle Avenue, Dover, on August 2nd, 1921. I was in the garden when it was caught. It was first seen on a row of garden peas."

ISSORIA LATHONIA NEAR DORCHESTER.—While working for *A. bellargus* I netted a very fine specimen of *I. lathonia*; judging by its appearance it must have just emerged from the chrysalis. The only other species worth mention was a fine male *Colias edusa*, the only one I have seen this season. Another remarkable capture was *Polygonia c-album* in my garden at Southbourne on July 24th.—A. FORD; 36, Irving Road, Bournemouth.

CATOCALA FRAXINI IN SCOTLAND.—I found a good specimen of *C. fraxini* at rest on a refreshment tent at Bay of Uigg, Kincardineshire, on August 22nd. Another specimen was seen by a young collector early in September at Portlethen, about three miles from where I took my specimen.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

NOTES ON THE REARING OF THE LARVÆ OF MELITEA CINXIA.—*À propos* Mr. Mayor's article in this month's 'Entomologist,' I quote from my diary under date September 17th, 1872: "This morning I devoted to hunting for *M. cinxia* larvæ. I commenced operations just outside the town of Ventnor to the westward, where I happened

to know the butterfly occurred. I searched every patch of the narrow-leaved plantain I could find, turned over the leaves carefully on my hands and knees, examined all the fields where the plant grew, but without success. I then gave it up as a bad job and walked along the cliff, but I had not gone very far when close to the path I noticed a web attached to a clump of grass, which at first I took to be a spider's web, but on further investigation proved to contain a number of minute larvæ which I at once concluded to be those of *cinxia*, at which I was highly delighted; further search resulted in finding four or five more 'webs.' The larvæ were in a state of hibernation, the webs being quite closed up. The locality where I discovered them was between the coastguard path and the edge of the cliff—a declivity of about fifteen yards. The plantain grew here in some profusion; some of the 'webs' were 'made up' in the grass close to the food plant, others close to the roots." On March 2nd, 1873, the larvæ commenced to emerge from their winter quarters, and I then transferred them to a warmer place in the garden against a wall facing the south, and provided them with an abundance of growing plants of narrow-leaved plantain, which I covered over with muslin. The larvæ thrived and grew with great rapidity, but I was amazed at the numbers that emerged from their webs by the hundred, and I felt really sorry that I had collected so many. I had about 300 specimens, no casualties among the larvæ and no varieties among the perfect insects. The butterflies emerged from June 8th to July 8th.—A. H. JONES; Eltham, September 2nd 1921.

REARING EUPITHECIA INDIGATA.—Will any of your readers kindly give me their practical experience of rearing the larvæ of this species? Buckler illustrates the larva "after final moult, July 18th." Edward Newman says "the larvæ are full fed from the middle to the end of July." Barrett says the larvæ feed "during June and July," while, on the other hand, L. W. Newman makes the insect partially double-brooded with larvæ in June and July, and a partial second emergence in August, but of whose life-history he says nothing. During the past two summers I have endeavoured to rear the insect from the egg. Last year, on Scotch fir, the larvæ fed on and on till the end of September, when the last one died, none having pupated. This year I put them on larch and again they have fed continuously till now, and (except that one has pupated) they are still feeding. On two occasions I have beaten in July in the hope of getting full-fed larvæ. On both occasions I have only succeeded in obtaining quite small larvæ. I consider the larvæ very delicate and far from easy to rear.—PERCY C. REID; Feering Bury, Kelvedon, September 5th, 1921.

TRICHOPTERA AND EPHEMEROPTERA IN 1920.—Mr. K. G. Blair, B.Sc., sends me the following note of captures: TRICHOPTERA.—May 14th, *Hydropsyche pellucidula* at Staplefield, Sussex; May 22nd, *Goëra pilosa*, *Notidobia ciliaris* and *Cyrtus trimaculatus*, canal near Uxbridge; June 27th, *Plectrocnemia conspersa* on tree-trunks in Epping Forest, also *Limnophilus sparsus* and *L. centralis*; August

7th, *Limnophilus xanthodes* in a juniper-bush on the top of the downs at Wendover; September, *Limnophilus affinis*, *L. marmoratus* and *L. lunatus*, near Lewes, Sussex. EPHEMEROPTERA.—May 14th, *Ephemera danica*, *Clocon dipterum*, *Centrophilum luteolum* and *Leptophlebia helvipes* at Staplefield, Sussex; May 21st, *Siphylurus armatus*, nymphs at Stanmore Common from which imagines emerged next day and days following (also *Leptophlebia helvipes*); May 22nd, *Ephemera vulgata*, *E. danica* and *Habrophlebia fusca* from canal at Uxbridge.—W. J. LUCAS; Kingston-on-Thames.

CRICKETS AND REFUSE DUMPS.—During the present year two cases have been recorded of *Gryllus domesticus* occurring in the open in association with refuse dumps ('Entom.,' liv, p. 127; 'Ent. Mo. Mag.,' lvii, p. 185). These dumps were in the neighbourhood of Hatfield and Huddersfield respectively, and it is now possible to add a third instance of the same kind met with in Middlesex. Early in August one of my sisters, Mrs. G. J. Ashby, told me that she had both heard and seen a number of common house crickets on and about an extensive rubbish-heap near West Drayton, and on subsequent occasions she collected several specimens for me. I understand that the refuse composing the rubbish-heap is brought from houses in the west of London, and that some of the materials are destroyed by burning. I do not know when this colony of crickets was first established, but in any case the hot weather of the present year would help them to maintain an outdoor life, and the artificial heat engendered by burning would afford further assistance in the same direction.—HERBERT CAMPION; 58, Ranelagh Road, Ealing, W. 5, September 12th, 1921.

SOCIETIES.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—July 14th, 1921.—The President in the Chair.—Mr. G. S. Baker, of West Brompton, was elected a member.—There was a short discussion on *Xanthorhœ* (*Cidaria*) *rivata* and *X. (C.) alternata (sociata)*, introduced by Mr. Hy. J. Turner, who dealt at length with the nomenclature and differentiation and briefly with the variation.—Mr. A. A. W. Buckstone exhibited series from several localities and referred to a later and darker form of *X. alternata (sociata)*.—Mr. Mera, series of both species, and referred to the variation occurring in Britain, dealing especially with the Isle of Lewis dark race of the latter species.—Mr. Enefer read a note on his exhibit of *Hylobius abietis*, a beetle recently becoming abundant in the south of England.—Mr. H. Moore, an ant-lion he had bred from the larva given him by Mr. Main from South France, and also an aberration of *Anosia berenice* from Florida.—Mr. Priske, the unusual winged form of the water Hemipteron *Velia currens*.—Mr. Blair, the fire-fly, *Phengodes laticollis*, from Washington, and read notes on its life-history.—Mr. Turner,

further species of Lepidoptera from California sent to him by Mr. G. B. Pearson.

July 28th, 1921.—The President in the Chair.—Mr. Edwards, various insects taken by him at Digne in April, 1897.—Mr. Main, an example of the second ecdysis form of *Gryllus campestris*; puparia of the tsetse-fly from South Africa; ova of the "Katydid" locust of North America; and a young trap-door spider, *Atypus affinis*, from Epping Forest.—Mr. Ashby, the *Coccinellidae* from the collection of the late Mr. Ashdown, 2220 specimens.—Mr. Goodman, a nest of the wasp *Polistes gallicus* and a larva of *Hyles euphorbiæ* from the Dauphiné.—Mr. Farmer said that it was reported that a specimen of the "large copper" has been taken at Limpsfield, and Mr. Edwards suggested that it was possibly an escape from Capt. Purefoy's rearing experiments in Kent.

August 11th, 1921.—The President in the Chair.—Mr. Edwards exhibited apples infested with the apple-scale *Mylelaspis pomorum*.—Mr. Hy. J. Turner, a chrysalis of *Pyrameis atalanta* from Betws-y-Coed, North Wales.—Mr. Blenkarn, *Melanophila acuminata* from Crowthorne, taken from actually burning pine-stumps, *Lebia cyanocephala* from Boxhill, *Cassida fastuosa* on *Senecio jacobææ* at Boxhill, *Dianous cærulescens* from the Mole near Boxhill, *Liparus germonus* on hogweed in Kent, *Aromia moschata* in London, *Bythinus glabratus* in a nest of *Lasius flavus* at Boxhill, etc.—Mr. Ashby, *Stauropus fagi* and *Asthena blomeri* taken at the Chalfont Field meeting.—Mr. T. H. Grosvenor, six distinct shades of blue in *Agriades thetis*, including a unique specimen with scattered black scales, and a very pronounced ♀ ab. *ceronus*.—Mr. K. G. Blair, a living bred *Papilio podalirius* from South France and a *Gryllus bipunctatus* taken in the docks.—Mr. Withycombe, stereoscopic slides of ova of a Hemipteron and of the Tineid *Harpipteryx xylostella*.—Mr. Tonge, a presumably third-brood specimen of *Pararge egeria*, bred from a female captured at Chalfont on June 25th.—Mr. Goodman, two distinct races of *Erebia tyndarus* from La Grave and the Engadine.

August 25th.—The President in the Chair.—Mr. Edwards exhibited the black "cherry-aphis," *Myzus cerasi*, and the greenhouse "white-fly," and referred to the methods of control of the latter pest.—Mr. Turner, a cocoon of *Rothschildia aurota* from which a large imago had emerged, with ova laid by it; a chrysalis of *Papilio thaos*, remarkably resembling a piece of rotten stick; and a pupa of *Eastes magnifica*, pointing out the rough file-like surface characteristic of the genus.—Mr. Withycombe, *Ascalaphus ottomanus* from Digne, a new record for France.—Mr. Coxhead, a dipterous gall, *Oligotrophus corni*, on dogweed.—Mr. Main, in his terrarium the larva of *Necrophorus interruptus* reared from ova; it would probably pupate in the spring.—Mr. Goodman, European species of "coppers" for comparison, *Heodes virgaureæ*, *H. hippothoë*, var. *eurybia*, *Chrysophanus dispar* and var. *rutilus*.—Mr. Coppeard, one of six similar aberrations of *Arctia caja*, in which the usually cream-coloured banding had a beautiful pink flush.—HY. J. TURNER, Hon. Editor of Proceedings.

OBITUARY.

JOHN GARDNER. DIED JULY 21st, 1921.

ONE of the last of the old school of entomologists passed away on July 21st, leaving a great gap in the small circle of north country collectors.

A native of Teesdale and born about the year 1840 he would be over eighty years of age at the time of his death, he removed in early life to West Hartlepool, where he went into business as a timber merchant and rarely left his native county during his long life, preferring to collect and study the local fauna to making trips to the more celebrated localities.

His work, in consequence, was somewhat circumscribed, but with splendid collecting ground on the cliffs at Blackhalls, Greatham marshes and the wooded denes all close to hand he was never at a loss for interesting work, and to within a year or two of his death he was still turning up species new to his taking.

He was never inclined to write much, and the record of his work is chiefly to be found in the Catalogue of the Lepidoptera of Northumberland and Durham, of which he became the Editor on the death of John E. Robson in 1907; its pages are scattered over from one end to the other with his records and captures, and for local insects there is no one left possessing his intimate knowledge.

Barrett, Buckler and many others were indebted to him for help in their work both with regard to the habits of the perfect insects and for larvæ which he discovered, the latter being at all times his favourite method of collecting—indeed if an insect was seen he would never be satisfied till he had done his best to turn up and breed its larva as well.

He was always eager to help the younger generation with information, naming specimens and types, and the writer owes a deep debt entomologically speaking to him for advice and encouragement given freely for over twenty years.

His cabinets were given just before he died to the Hancock Museum, Newcastle-on-Tyne, where the contents will be available in the future for students who may wish to examine the long series of many species which they contain, together with types of nearly all the British species, except a few of the rarest.

His interests were not confined to Lepidoptera as he had a fine collection of local and rare Coleoptera, also at Newcastle Museum, and his garden, though small, was one of the best in the district.

Mr. Gardner was elected a Fellow of the Entomological Society in the year 1890, and continued his Fellowship until the time of his death.

A few years ago threatenings of heart trouble compelled him to give up active work, and he finally passed away through an attack of angina pectoris. He left no children, and the writer's deepest sympathy goes out to his widow after so many years of married life.

JAMES W. CORDER.

EXCHANGE.

The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused. *Marked * are lost.*

✉ NOTICES OF EXCHANGE should be received by the 21st of each Month to insure insertion. Not more than Six Lines can be allowed for each

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-
BURY, N W. 2.

MEETINGS OF SOCIETIES.

[illegible]

CONTENTS.

The Life-cycle and Habits of *Cydia Leguminana*, Z., with a Note on its Synonymy, *W. G. Sheldon, F.Z.S., F.E.S.*, 225. New and Little Known British Aphides. VI. *Fred. F. Theobald, M.A.*, 230. South American Eumolpidae. Mostly of the Group Colaspini, *Fred. C. Bowditch (continued from p. 216)*, 234. Four New Moths from the Philippines, *A. E. Wileman and Richard South*, 237.

NOTES AND OBSERVATIONS.—*Aretia carya utahensis*, Hy. Edw., *T. D. A. Cockerell*, 238. *Pyrameis gonerilla* in New Zealand, *Margaret E. Fountaine, F.E.S.*, 238. The Larvæ of *Ino globulariae*, *W. G. Sheldon*, 240. Notes on Second and Third Broods, 1921, *J. E. Stafford*, 240. Second Emergence of *Hesperia malva*, *N. C. Rothschild*, 241. *Nisoniades tages*, Second Brood, *Charles M. Woodford*, 241. Second Brood of *Nisoniades tages*, *F. W. J. Jackson*, 241. *Nisoniades tages*, Second Brood, *F. J. Killington*, 241. *Polyommatus bellargus* at Portland, *F. J. Killington*, 241. *Colias hyale* and *Pyrameis cardui* in Essex, *F. W. Frohawk*, 241. *Colias hyale* at Hazeleigh, (*Rev.*) *Gilbert H. Rayner*, 242. *Colias hyale* in Sussex, *G. H. Simpson-Hayward*, 242. *Colias edusa* and *Caradrina ambigua* in South Devon, *J. E. Tarbat*, 242. *Chrysophanus phleas* Schmidt, *S. B. Hodgson*, 242. *Celastrina argiolus* treble-brooded, (*Rev.*) *Gilbert H. Rayner*, 242. *Canonympha pamphilis* var., *Augustus E. Stafford*, 242. *Brenthis selene*, Second Brood, again at Abbots Wood, *H. Worsley Wood*, 243. *Polygonia e-album* in Warwickshire, *E. Grosz Hedge*, 243. *Polygonia e-album* in Berkshire, *Morris J. Boorne*, 243. *Vanessa atropa* in Dorset, *Mary C. Bond*, 243. *Papilio bianor* taken at Brighton, *F. G. S. Bramwell*, 244. *Lampides betuleus* at Dover, *G. O. Sloper*, 244. *Issoria lathonia* near Dorchester, *J. Ford*, 244. *Catocala fraxum* in Scotland, *L. G. Esson*, 244. Notes on the Rearing of the Larvæ of *Melitæ cynthia*, *A. H. Jones*, 244. Rearing *Eupithecia indigata*, *Percy C. Reid*, 245. Trichoptera and Ephemeroptera in 1920, *W. J. Lucas*, 245. Crickets and Refuse-dumps, *Herbert Campion*, 246.

SOCIETIES.—The South London Entomological Society, 246.

OBITUARY.—248.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, 1s. each, double numbers, 2s. each; 1915 and 1916, 9d. each, double numbers, 1s. 6d.; 1917 and 1918, 1s. 6d. each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each; 1915 and 1916 at 10s. 6d.; 1918, 15s. Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.

Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes, Setting Boards, Larvæ Cages, Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists &c.

LEONARD TATCHELL, Entomologist,
43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1921 (12s.) should be sent to R. South (Editor),
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

NOVEMBER, 1921.

No 702

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND-BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c. DR. D. SHARP, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid

Great deeds are done and great discoveries made."

LONDON.

ADLARD & SON & WEST NEWMAN, LTD.

BARTHOLOMEW CLOSE, E.C. 4

Price One Shilling and Sixpence Net.

WATKINS & DONCASTER, NATURALISTS.

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also

Birds' Eggs

(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION

36, Strand, London, W.C. 2.

30,000 British Micro-Lepidoptera, 800 species, moderate prices, selections on approval; cheap type collections. 200,000 British Coleoptera, 2500 species. 300 vols. Entomological Books and Magazines.

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (4 lines), or date, sex, locality, *serial numbers*, neatly and legibly printed in black ink on 100% white paper. 1,000 labels, **9 9**; 2,000, **12 9**; 3,000, **15 9**.

Locality and date only (2 lines) - 1,000 labels, **9 -**; 2,000, **12 -**; 3,000, **15 -**.

FOR MICROLEPIDOPTERA, &c.

Locality, date, and name (3 lines), or date, sex, locality, *serial numbers*, printed in the smallest type made. 1,000 labels, 12 -; 2,000, 15 -; 3,000, 18 -.

Locality and date only (2 lines) - 1,000 labels, **10 6**; 2,000, **13 6**; 3,000, **16 6**.

If desired, on initials or locuties, etc., or on any additional line, in either style of type, **1 6** extra. Special windings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations

1,000 labels, **1 6**; 2,000, **3 -**.

Please state whether *upper* or *lower* pointers required.

Herbarium and other (10 x 8 x 8) paper.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 4.

THE ENTOMOLOGIST.

VOL. LIV.]

NOVEMBER, 1921.

[No. 702]

A NEW ABERRATION OF *ARICIA ASTRARCHE*.

BY WILLIAM CARTER.

ON July 16th of this year, the occasion of an excursion of the Natural History Society of Northumberland and Durham to Blackhall Rocks, I was fortunate enough to capture a beautiful form of the Brown Argus in the same restricted locality as has produced so persistently the form *vedræ*, Harr. Dr. J. W. H. Harrison, who has described so many varieties of this insect (see Tutt, vol. iv, pp. 244-7), has been good enough to help me in this case, and the following is our joint description :

Aricia astrarche, ab. *cuneata*, nov.

This form clearly belongs to the *vedræ-albicans* group, but differs markedly from all.

Above, the insect appertains in facies to the var. *semi-allous*, and thus calls for no comment.

Below, the fore wings are ashen grey in the ground-colour, except that the area between the discoidal spot and the upper five of the subterminal row of red spots is intersected by five broad pearly-grey dashes. The red spots themselves are slightly moved inward, whilst the black spots preceding them are progressively obsolescent as we pass from the anal angle to the costa. On the contrary the black spots usually following them are quite obsolete, but in compensation all the veins in that area are marked with a broad blackish bar. Similarly the terminal black line is broader than the normal. On the hind wings the ground-colour is a very slightly ochreous white, whilst the veins over the outward half of the wings are finely outlined in black brown; basally this outlining becomes diffused into the ground-colour to an extent just enough to show that the spot in the cell, although minus its pupil, has the same colour as the main ground-colour. The subterminal row of red spots has its individual members distinctly less than usual, but more concentrated in colour. Before it occur the usual black spots, but, as in the fore wings, those succeeding it are obsolete. Again, as in the fore wings, the veins in the area between the red spots and the fringes are heavily and broadly marked in blackish brown.

Altogether the impression one gains from the fore wings beneath is that they are dark in colour and traversed by pale wedges, whilst the hind wings strike one as being white with brown wedges.

Habitat.—Blackhall Rocks, Co. Durham.

The accompanying illustration shows a series of upper- and under-sides of *astrarche* vars., but for the moment and for the

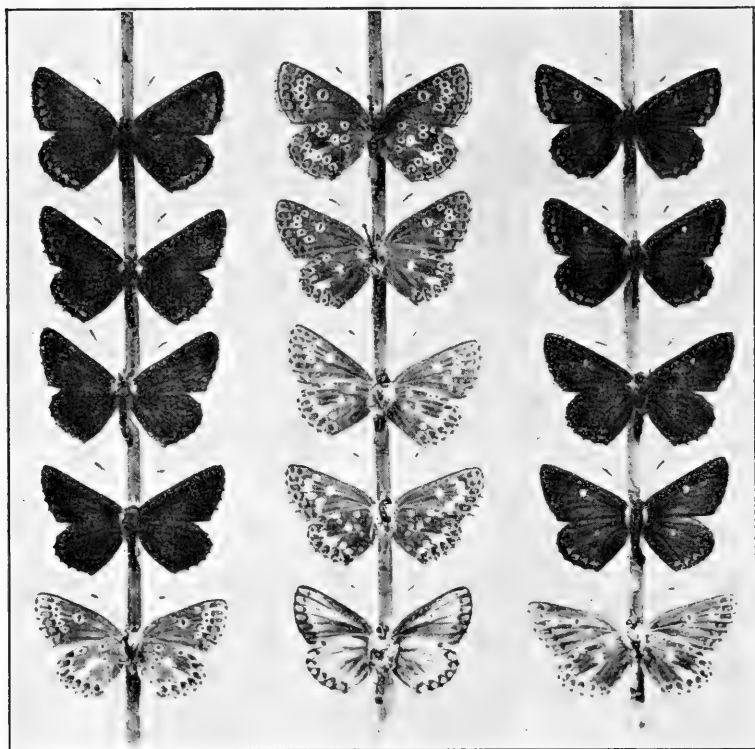


Photo. Philipson & Son, Ltd., Newcastle-on-Tyne.

purpose of comparison only the under-sides need be specifically mentioned. They are:

First row: ab. *discreta*. Second row: type *astrarche*, ab. *redæ*, var. *salmacis*, var. *artaxerxes*, ab. *cuneata*. Third row: ab. *deleta*.

These seven are Durham Coast specimens—in fact fourteen of the fifteen illustrated are from this county.

I hope at a later date to deal with the whole series illustrated.

13, Kimberley Gardens;
Newcastle-on-Tyne.

COLIAS EDUSA, FAB. (CROCEUS, FOURC.):
ITS SEASONAL FORMS, VARIETIES AND ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

(Continued from p. 187.)

Besides the aberrations and forms published, and satisfying the formula to some extent, "*pas de bonne figure, pas de nom valable*," I find several others, *e.g.* those, to which no allusion has been made by me, on Mr. Fitch's plate in the 'Entomologist' for 1878. (a) Schopfer also figures ('Iris,' vol. xii, pl. ii, fig. 2, 1899). under *C. hyale*, L. (= *edusa*, F.), a male in which the nervures from the outer marginal band at apex are continued through to the discal spot, giving the example a streaky and smudgy appearance to some extent (probably = *Striata*, Geest (r), or very near to it). On the underside, also figured, the black connecting streaks are even more pronounced. The hind wing shows a brownish streak connecting the discal spots with the inner margin, and the spots themselves are very small. The example was taken at Partenkirchen in Bavaria, and the author is to be commended for not having at once labelled it with a fancy name.

(b) Dr. Verity figures ('Rhopal. Palæarct.,' pl. xlv, fig. 35) a ♀ ab. of the *gen. vern.* bred from Hyères larvæ by Mr. Harold Powell of that town. The discal spots on the fore wings are enlarged, and the yellow nervures traverse the marginal bands as in the typical male, while the yellow spots at the margin are reduced and suffused.

The above retained thirty-four varietal and aberrational forms are, so far as I can ascertain, all described to the date of this paper. It is possible, and highly probable, that in Germany and elsewhere the list has been extended during and since the war. If so, I shall be greatly obliged if readers of the 'Entomologist' will refer me to the sources in which such publications have appeared. The system of giving names to local forms, and especially to individual aberrations, is only to be commended where applied throughout a genus in such a way that the parallel range of variation in all the species of that genus is represented by identical nomenclature. *Colias edusa* has been fortunate in this one respect. Its described forms, as to the majority of them, do bear some relation to the variation awarded the dignity of a distinctive name. The names *Faillæ* (u) and *Cremonæ* (l) alone record the original discoverer, and do not of themselves suggest the particular form concealed under their denomination. On the other hand, among those recently described, however beautiful the name from an æsthetic point of view, names like *Adoratrix* (f) are of as little value scientifically as proper names imperfectly latinised. I must plead guilty to having invented

Cinerascens (g) ; but I feel sure that someone else would inevitably have supplied the deficiency, as soon as detected, and my object in making this one addition to the catalogue, already too long, is to secure uniformity in so far as the naming of a colour form permits of it.

The fact that *Edusa* is not an indigenous species in the United Kingdom increases rather than depreciates interest in its variation. Incidentally, in the western palæarctic region it is the most stable species of the *Colias* group, for whereas Mr. Sheldon's observations* and captures in south-east Russia indicate a normal habit of hybridisation among the "pale" *Coliads*—e.g. *C. hyale* × *C. erate*—there is as yet no recorded instance, I believe, certainly in Britain and France, of hybrid *Edusa* × *Hyale*, although the two species are often on the wing at the same time, haunt the same localities, and must be in frequent contact all over Europe. The problem of the "white" females in *Colias* remains a problem. All that can be hazarded is that the original form of *Colias* female was a pale form, and that the yellow normal form, disclosing a tendency to maleness, has succeeded in dominating the original until it has ousted the ancestral pale form altogether, and itself become the normal. As I remarked at the beginning of this paper, there are localities left in which the proportion of pale to yellow female forms is still pronounced. But they are few and far between ; and as the white form appears to be extremely rare in the vernal emergencies—if occurring at all except accidentally—the evolutionary transition of colour form in the female may be considered established.†

I trust the compilation which I have made will at least prove useful for reference to students of variation, as well as to collectors anxious to identify and name such departures from the type as they may have encountered in the fields in those golden years—for *Edusa* years are usually golden years for the lepidopterist in every sense—when this adventurous and beautiful butterfly renews its, alas !, fruitless efforts to enrol itself in the little army of true British butterflies.

In conclusion, I wish to express my gratitude and thanks to Dr. Roger Verity, of Florence, Dr. Ubaldo Rocci, of Genoa, and Mr. C. E. Morris, of Le Cannet, Alpes-Maritimes, for the great assistance they have given me throughout, especially in regard to the seasonal appearances and forms observed in Sicily, central and north Italy, and the French Riviera respectively.

Harrow Weald :

January 21st. 1921.

* "An Expedition in Search of Russian Butterflies," 'Entomologist,' vol. xlvii, pp. 270-271, etc., 1914.

† Mr. Morris reports two examples of the *gen. vern.* which he refers to ab. *helice* (in litt., October, 1921).

[My revision of this paper has been interrupted by illness. Prof. Cockerell has drawn my attention to certain forms named and described by him ('Entomologist,' xxi, 1889). I hope to deal with these, and to supplement my observations with some interesting notes on the species in 1921 on the Riviera by Mr. Morris, in a future number of the 'Entomologist.'—H. R.-B.].

A LIST OF THE NAMED VARIETIES AND ABERRATIONS OF *COLIAS EDUSA*, F.

- | | |
|--|--|
| (a) Ab. ♀ <i>Helice</i> , Hb. | (s) Ab. <i>Velata</i> , Ragusa. |
| (b) Ab. ♀ <i>Helicina</i> , Obthr. | (t) Ab. ♂ <i>Atofasciata</i> , Rocci. |
| (c) Ab. ♀ <i>Pallida</i> , Tutt. | (u) Ab. <i>Obsoleta</i> , Tutt. |
| (d) Ab. ♀ (vel forma) <i>Albissima</i> , Ragusa. | (v) Ab. ♀ <i>Subobsoleta</i> , Rocci. |
| (e) Ab. ♀ <i>Cerulea</i> , Verity. | (w) Ab. ♂ <i>Failla</i> , Steph. |
| (f) Ab. ♀ <i>Adoratrix</i> , Stauder. | (x) Ab. ♂ <i>Helena</i> , H.-S. |
| (g) Ab. ♂ <i>Cinerascens</i> , Rd.-Brn. | (y) Ab. ♂ <i>Micans</i> , Fritsche. |
| (h) Ab. <i>Brunnea</i> , Tutt. | (z) Ab. ♀ <i>Divisa</i> , Verity. |
| (i) Ab. <i>Flavida</i> , Ksen. | (aa) Ab. ♀ <i>Semidivisa</i> , Rocci. |
| (j) Ab. (vel forma) <i>Fulvosignata</i> , Rocci. | (bb) Ab. ♀ <i>Internodimidiata</i> , Verity. |
| (k) Ab. ♂ <i>Deserticola</i> , Verity. | (cc) Ab. ♂ <i>Semiobsoleta</i> , Rocci. |
| (l) Ab. <i>Cremonæ</i> , Bang-Haas. | (dd) Ab. ♀ <i>Seriata</i> , Rocci. |
| (m) Ab. <i>Chrysothemiformis</i> , Verity. | (ee) Ab. <i>Deannulata</i> , Rocci. |
| (n) Ab. ♂ <i>Passa</i> , Verity. | (ff) Ab. <i>Bimaculata</i> , Verity. |
| (o) Ab. ♀ <i>Melanitica</i> , Verity. | (gg) Ab. <i>Ægra</i> , Verity. |
| (p) Ab. <i>Nigrofasciata</i> , Verity. | (hh) Ab. (vel forma) <i>Minor</i> , Verity. |
| (q) Ab. ♀ <i>Suffusa</i> , Tutt. | (ii) Var. <i>Pyrenaica</i> , Gr. Gr. |
| (r) Ab. ♂ <i>Striata</i> , Geest. | (jj) Ab. <i>Ampla</i> , Verity. |

SEASONAL FORMS.

- (i) *Forma vernalis* (gen. vern.), Verity.
- (ii) *Gen. æst. Edusa*, F.
- (iii) *Forma autumnalis*, Rocci (gen. autumn).

SOUTH AMERICAN EUMOLPIDÆ, MOSTLY OF THE GROUP COLASPINI.

BY FRED. C. BOWDITCH.

(Continued from p. 236.)

Rhabdopterus sulcipennis, sp. nov.

Ovate, broad; purplish bronze; antennæ fulvous; joints 6, 7, 10 and 11 dark; thorax rather thickly, finely and evenly punctulate; elytra strongly subgeminately punctate; the intervals longitudinally costate and convex, strongly so at the apex.

Type, ♀, Prov. Huallaga, Peru, Rio Mixiollo (Baer).

Length, 6 mm.

Stout and broad; head with the transverse and longitudinal impressions not particularly developed; punctuation sparse on

the vertex ; thicker between the antennæ, which are of moderate length. Labrum rufous ; thoracic punctuation nearly even. A slight foveate depression near the anterior angles ; sides nearly evenly rounded, and with a scarcely noticeable subangulation at the middle, and only then at a certain angle. Elytra with well-marked foveate depression below the shoulder ; the punctures in strong semi-geminate rows, becoming single when the heavy sulcation begins towards the apex ; all the punctures and reflexed margins are obsoletely metallic green ; below and legs dull purplish black, tinged with bronze.

Nearly allied to *peruensis*, Jac.

Rhabdopterus ignotus, sp. nov.

Medium sized. Ovate, broad, shining bronze ; below, with legs almost black ; thorax irregularly, mixed punctate ; coarsely and semi-aciculate at the sides ; elytra strongly, at the sides coarsely punctate ; semi-seriate on the disc and striate towards the apex.

Type, ♀, Callanga (?) Peru (second Jac. Coll.).

Length, 5.5 mm.

Stout ; head rather closely punctate, especially on the lower front ; wide frontal and well-marked longitudinal foveas, taking the places of the usual depressions. Antennæ rather short ; rufous, joints more or less tinged above with black ; thorax broad, with a wide reflexed margin ; sides subangulate at the middle ; surface with scattered, ill-defined smooth areas, especially at the middle, with a well-marked broad depression each side behind the middle ; the coarse punctures are almost entirely confined to the sides ; elytra with deep transverse depression below the shoulder. The punctuation is much like what I have identified as *cuprinus*, Lef., from Caracas ; the reflexed margins and punctures are more or less obsoletely metallic green ; closely allied to *peruensis*, Jac., and to *sulcipennis*, *supra*.

Rhabdopterus punctatissima, sp. nov.

Small, rather elongate. Below rufous ; breast darker ; above brownish rufous ; the thorax and elytra overlaid with metallic plumbeous lustre ; feet dark purplish, with bases of femora and tibia rufous ; thorax very densely, evenly and finely punctulate ; antennæ rufous ; joints 7, 9, 10 and 11 dark.

Type, ♂, ♀, Paramba, 3500 ft., February, 1897, dry season (Rosenberg).

Length, 4.5 mm.

Head finely but not very thickly punctate ; the usual cross depression not deeply marked, and the longitudinal in the ♀ much more strongly indicated than in the ♂ ; thorax almost without depression ; the punctuation very fine and almost even ;

the lateral edge narrowly reflexed, and obsoletely metallic green. Elytra broadly, obsoletely depressed below the shoulder, strongly punctate; subseriate next the suture and costate at the apex; the latter feature as usual most pronounced in the ♀, which also has a more or less well-defined costa from the shoulder to the apex; the reflexed margin is obsoletely metallic.

Rhabdopterus rosenbergi, sp. nov.

Small, stout. Below very dark brown, almost black; above dark æneous bronze, shining. Legs dark brown, with middle of the femora rufous; thorax transverse, much widened at about the middle; sides nearly straight from the base to the middle, then abruptly narrowed to the front, giving the appearance of sub-angulation; elytra (♀) with sides covered with irregular tubercles and rugosities.

Type, ♀, Cachabà, low c., November, 1896 (Rosenberg).

Length, 4.5 mm.

Head smooth, except for a few fine punctures on the epistome; the cross depression strong; the vertex smooth, impunctate or nearly so. Antennæ rufous? (four joints missing); thorax rather obsoletely collared in front, and excessively finely and obsoletely punctulate; elytra with well-marked transverse depression; finely seriate punctate, obsoletely costate at the apex. The sides and more or less of the discal and basal parts broken up into series of irregular smooth tubercles or rugæ, which has the effect of breaking the seriate punctuation; the reflexed margin and the punctuation is obsoletely metallic in a strong light. The smooth thorax and tubercular elytra are different from any other known to me.

Podoxenus distortus, sp. nov.

Æneous bronze, the elytra with a rufous tinge, so they do not appear as golden as the thorax, which, in both sexes, especially in the ♂, is very much puffed up or swollen; transverse, and strongly angulate at the middle side, the surface shiny and finely punctured; elytra are coarsely, semi-seriately punctate, transversely rugose on the sides, costate and tuberculate at the apex; the anterior and middle tibiæ of the ♂ so bent inwards as to seem almost useless for walking.

Type, ♂ and ♀, Ribeirao, Pires, San Paulo, Brazil, 11-19 (Gounelle).

Length, 7 mm.

Head rather sparsely punctured, with well-defined transverse and poorly-defined longitudinal marks; calli smooth and large; antennæ rufous, barely reaching the middle of the elytra; the thorax is margined all around, the punctuation becoming sparser towards the sides, especially the hind angles in the ♂; the scutel

is smooth and rather truncate; elytra with obvious transverse depression where the punctures are enlarged, becoming foveate, especially in the ♀; the legs are æneous with tibia dark rufous, shading off into lighter on the apex and tarsi; the upper rear edge of the front ♂ tibia has a comb or fringe of long golden hair, very noticeable; the curve at the end of the ♂ middle tibia is almost semicircular.

A very extraordinary form, and showing all the generic characters abnormally exaggerated.

Boston, Mass., U.S.A.

THREE NEW *STEPHANIDÆ* FROM JAVA.

By E. A. ELLIOTT, F.E.S.

Stephanus pilosus, sp. nov.

♂. There are sparse white hairs on the head, longer and denser on the petiole and apex of abdomen. The pleuræ are covered with dense white pilosity, and on the legs, the hairs, though less dense, are longer and more conspicuous.

Frons, vertex and occiput strongly arcuate rugose; one strong carina between the posterior ocelli and two behind them; ocellar space depressed. Posterior margin of head broad and slightly reflexed. Cheeks and temples smooth, with a few setiferous punctures. Second flagellar joint fully twice as long as first, third a little longer than second. Prothorax transcarinate; semiannular smooth and laterally hairy. Scutellum centrally smooth, lateral lobes coarsely rugose-punctate. Mesonotum coarsely transcarinate. Propleuræ finely, mesopleuræ coarsely punctate. Metapleuræ and median segment cribrate punctate, and separated by a strong carina, which is anteriorly somewhat rugose, posteriorly smooth and shining. Petiole trans-striate, basally more coarsely, shorter than rest of abdomen, which is smooth. Hind coxæ stout, coarsely transrugose; femora smooth, bidentate, the teeth long and acuminate; tibiæ as long as femora and trochanters, strongly compressed in basal third.

Black; head, scape and apex of anterior femora red, frontal tubercles apically black. Wings slightly iridescent; fore wings centrally, hind wings apically infumate; stigma and nervures black-brown.

Length, 22 mm.; abdomen, 14½ mm.; petiole, 6 mm.

Hab.—Palaboehan, Ratoe. M. E. Walsh (*ex* Frisby), February 22nd, 1916. Type in coll. Claude Morley.

In the coarse sculpture and conspicuous pilosity this species much resembles *S. villosus*, Kieff.

Stephanus rugosus, sp. nov.

♂. Frons arcuate rugose; vertex and occiput with strong longitudinal carina, occiput regularly, vertex less regularly arcuate striate;

three strong carinæ behind posterior ocelli. Posterior margin of head bordered. Cheeks slightly shorter than scape, smooth; temples smooth. Second flagellar joint twice as long as first; third slightly shorter than first and second together. Neck of prothorax transcarinate, semiannular smooth with a few punctures. Propleuræ finely trans-striate. Mesonotum apically smooth, central row of punctures distinct, the smooth space on each side with a single puncture before and behind, laterally strongly punctate, separated from the scutellum by two carinæ. Scutellum centrally smooth, laterally strongly rugose-punctate. Metapleuræ and median segment cribrate punctate, separated by a strong carina. Petiole strongly transrugose, shorter than the remaining smooth segments. Hind coxæ coarsely trans-striate; femora smooth, bidentate; tibiæ slightly longer than femora, compressed to middle.

Black; head, except apices of mandibles, and apex of thorax above red; anterior legs more or less rufescent. Wings hyaline.

Length, 16 mm.; abdomen, 10 mm.; petiole, $4\frac{1}{2}$ mm.

Hab.—Java, Preanger Regency, near Seekoboemi. M. E. Walsh, 1918. Type and cotypes in coll. Claude Morley.

This species bears a superficial resemblance to *S. unicolor*, Schlett, and to *S. ducalis*, Westw., but differs considerably in sculpture.

Fœnatopus variidens, sp. nov.

♀. Frons and ocellar space very finely striate; vertex and occiput transversely, almost arcuately striate. Posterior margin of head strongly bordered. Cheeks slightly shorter than scape, smooth; temples smooth. Second flagellar joint one and a half times as long as first, third nearly as long as first and second together. Prothorax finely trans-striate, neck elongate, apically above deeply excised. Mesonotum irregularly rugose-punctate, central row of punctures distinct; scutellum centrally smooth, lateral lobes punctate. Mesopleuræ smooth; metapleuræ and median segment cribrate punctate and not separated. Petiole finely trans-striate, slightly shorter than rest of abdomen. Terebra longer than body, black, with a white band 3 mm. broad before the 1 mm. broad black apex. Hind coxæ trans-striate; femora smooth, tridentate; tibiæ slightly longer than femora, compressed almost throughout.

Black; head ferruginous, frons darkest, inner orbits and anterior frontal tubercles paler; vertex, including ocellar space, and occiput black. Front tibiæ and tarsi, base of intermediate femora, their tibiæ externally and apical tarsal joints rufescent, metatarsus white. Hind legs entirely black except the middle and apical femoral teeth, which are white. Wings iridescent, nervures pale brown, stigma centrally translucent.

Length, 16 mm.; abdomen, $9\frac{1}{2}$ mm.; petiole, $4\frac{1}{2}$ mm.; terebra, 18 mm.

Hab.—Paleboehan, Ratoe. M. E. Walsh (*ex* Frisby), February 22nd, 1916. Type in coll. Morley.

The colour of the femoral teeth is distinctive. In *F. rugiceps* the basal tooth is white and the apical black; on the present species this is reversed.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 208.)

Coremia (Ochyria) ferrugata, Clerck.—Kane notes that this species is plentiful at Favour Royal and Altadiawan, where an extreme striated form occurs, abundant in E. Tyrone, but less common than the preceding, ochreous forms near Lough Fea.

Coremia (O.) designata, Hufn.—Fairly abundant in damp woods, Favour Royal and Altadiawan (K.), Killymoon, Lissan and at Stewartstown.

Amœbe viridana, Fb.—Abundant almost everywhere.

Malenydris salicata, Hb.—Locally abundant at Altadiawan (K.), common on rocky ground near Lough Fea, where ab. *unicolorata*, Gregson, occurs, bogs near Cookstown.

Malenydris multistrigaria, Haw.—Widely distributed and common in the county; ab. *virgata*, Tutt, at Lough Fea.

Malenydris didymata, L.—Very abundant, dark forms on the bogs.

Oporabia (Epirrita) dilatata, Bork.—Common in woodlands; banded forms approaching ab. *latifasciata*, Prout., at Killymoon and Baronscourt.

**Oporabia (E.) christyi*, Prout.—Locally abundant in birch woods near Cookstown and Stewartstown.

**Oporabia (E.) autumnata*, Gn.—Very local in woods at Killymoon.

Venusia cambrica, Curt.—Local, at Altadiawan and Favour Royal (K.).

Entephria cesiata, Lang.—Abundant on the mountains and moorlands; pale forms with dark central fascia near Lough Fea.

Xanthorhoë montanata, Bork.—Very abundant everywhere; a form approaching var. *shetlandica*, Weir., is not uncommon.

Xanthorhoë fluctuata, L.—Common and widely spread, but rare on the uplands, where the last species is often abundant; several ab. *costovata*, Haw., and dark forms are common.

**Xanthorhoë galiata*, Hb.—Very local on sandy ground at Washing Bay, Lough Neagh; examples taken here have the central band dark purplish black; ab. *unilobata*, Haw.

Xanthorhoë (Epirrhoë) sociata, Bork.—Very abundant everywhere.

**Xanthorhoë (Euphyia) unangulata*, Haw.—Kane states that

this species is very local and uncommon, but no doubt it has been much overlooked, as it is locally abundant and widely spread in this district (East Tyrone), some examples having the white stripe slightly tinted with ochreous. Localities: Lissan, at Cookstown, Killymoon, and very common near Stewartstown; larvæ on *Galium palustre* as well as *Stellaria*.

Eulype hastata, L.—Kane met with this species at Altadiawan.

Mesolenca albicillata, L.—Locally abundant in woods where *Rubus idæus* is common, Favour Royal (K.), Lissan, Killymoon, near Stewartstown, and at Lough Neagh.

Mesolenca ocellata, L.—Local, but often abundant; sometimes very numerous in woods carpeted with *Galium saxatile* at Lough Fea.

Mesolenca bicolorata, Hufn.—Abundant among alders; ab. *plumbata*, Curt., a form near this, at Stewartstown.

Perizoma affinitata, St.—Not uncommon locally; Kane records a form from Altadiawan with the waved band partly obsolete, and of a brown tint. Other localities are: Favour Royal, larvæ near Cookstown (H.), Killymoon abundant, and at Loughry; the majority of the local specimens are referable to ab. *turbaria*, Step.

Perizoma alchemillata, L.—Locally abundant at Favour Royal (K.), Lough Fea (larvæ on *Erica cinerea*), Cookstown, near Stewartstown and Lough Neagh.

**Perizoma flucofasciata*, Thun.—Fairly abundant in May and June, near Killymoon and at Loughry; larvæ on *Lychnis diurna* near Cookstown (H.).

Perizoma albulata, Schiff.—Abundant in meadows.

**Perizoma bifasciata*, Haw.—Locally abundant and widespread in this district; imago swarming among *Bartsia* near Cookstown (H.); a variable series bred from larvæ, near Grange; Stewartstown and Lough Neagh.

**Perizoma adæquata*, Bork.—Rare, near Lough Fea.

Perizoma teniata, St.—Kane took this species not uncommonly at Favour Royal and Altadiawan.

Camptogramma bilineata, L.—Abundant everywhere, ab. *infusata*, Gump., common on moorlands and bogs.

Hydriomena impluviata, Hb.—Locally abundant among alder, varying from pale green to brown. Kane records a whitish suffused variety from Altadiawan. Other localities are: Lough Fea (H.), Lissan near Killymoon and at Stewartstown.

Hydriomena sordidata, Fb.—Very abundant among willows; moorland form at Altadiawan (K.), and at Lough Fea.

Hydriomena ruberata, For.—Kane records this species as rare at Favour Royal; abundant in this district, and pupæ common under bark of willows and willows, near Stewartstown, Lissan, and at Lough Neagh; larvæ on *Salix cinerea*, *S. caprea*, and *S. aurita* near Cookstown (H.).

Anticlea badiata, Hb.—Abundant everywhere in April.

Anticlea nigrofasciaria, Göze.—Locally common and widely distributed; several with central area whitish.

Eupithecia oblongata, Thub.—Not uncommon, larvæ on ragwort (H.).

Eupithecia pulchellata, St.—Abundant, especially in the Lough Fea district; larvæ common on *Digitalis*.

Eupithecia indigata, Hb.—Recorded by Kane from Altadiawan; rare in pine woods at Lissan.

Eupithecia venosata, Fb.—Local, but not uncommon near Grange, and at Killymoon; larvæ in seed-capsules of *Selene inflata*.

Eupithecia distinctaria, H. S.—Kane took this species at Favour Royal.

Eupithecia assimilata, Dbl.—Rare at Favour Royal (K.); a few in gardens, Stewartstown.

Eupithecia absinthiata, Clerck.—Generally abundant, larvæ on mugwort, *Artemisia vulgaris*, and ragwort.

Eupithecia goossensiata, Mab. —Locally abundant on heathery ground.

**Eupithecia albipunctata*, Haw.—Not very abundant, larvæ on *Angelica sylvestris* at Lough Neagh and near Tamnamore.

Eupithecia austerata, Hüb.—Widely distributed but not very common.

**Eupithecia virgaureata*, Dbl.—Rare; a few larvæ on *Solidago virgaurea*, and ragwort at Lough Fea.

Eupithecia lariciata, Fr.—Kane took this insect abundantly at Altadiawan.

Eupithecia castigata, Hb.—Very abundant.

Eupithecia satyrata, Hb.—Abundant on the moorlands and bogs; often swarming in ravines on the mountains; whitish grey forms near Favour Royal (K.).

**Eupithecia succenturiata*, L.—Kane found this species very local and scarce generally; not uncommon in the district, near Grange, and at Killymoon; var. *disparata*, Haw., has occurred at the former locality. Larvæ often abundant on mugwort, *Artemisia vulgaris*, but much subject to the attacks of parasites.

**Eupithecia subfulvata*, Haw.—Locally abundant and widely spread; the imago on ragwort, near Grange, Lissan; at Cookstown (H.), and near Stewartstown.

Eupithecia haworthiata, Dbl.—Taken at Favour Royal by M. F., vide Kane.

**Eupithecia plumbeolata*, Haw.—Not common near Lough Fea, and at Lissan.

**Eupithecia pygmaea*, Hb.—Common in a damp meadow near Grange, underlaid by magnesian limestone, also at Lissan, and near Stewartstown; larvæ on *Cerastium*.

Eupithecia tenuiata, Hb.—Not uncommon among sallows.

Eupithecia nanata, Hb.—Abundant and widely spread on the bogs and mountains.

Eupithecia abbreviata, St.—A common insect at willow catkins.

**Eupithecia dodoneata*, Gn.—Rare, near Stewartstown; a few larvæ from hawthorn.

Eupithecia exigua, Hb.—Generally common and widely spread among hawthorn.

Gymnoscelis pumilata, Hb.—Kane remarks of this species, "everywhere numerous"; very rare in this district.

Chloroclystis coronata, Hb.—Widely distributed, but not very common, also at Favour Royal (K.).

Chloroclystis rectangulata, L.—Not uncommon in gardens and orchards, and in woods and hedgerows among crab apple.

Pelurga comitata, L.—Common on the margins of cultivated fields and on waste ground.

Cænocalpe vittata, Bork.—Locally abundant in marshes and damp meadows.

Boarmiinae.

Abraxa grossulariata, L.—Generally abundant; one pale yellow aberration bred. In certain localities on the moorlands the larva feeds on ling, *Calluna*, and the imago is small and dark.

Lomaspilia marginata, L.—A common species among willows; at Killycolpy Wood on Lough Neagh, this moth sometimes occurs in hundreds among the undergrowth, and *ab. pollutaria*, Hb., is not rare.

**Ligdia adustata*, Schiff.—Locally abundant among *Euonymus europæus*, but almost confined to carboniferous limestone districts in the vicinity of Cookstown, Tullyhogue, and Stewartstown.

**Bapta temerata*, Hb.—Another local species, but often abundant among blackthorn scrub near Stewartstown; also common on bogs near Tamnamore, the larva in this locality feeding upon birch.

Cabera pusaria, L.—Very abundant everywhere.

Cabera exanthemata, Scop.—Common in damp localities. Kane notes a form from Tyrone (probably from Favour Royal), with the cross-lines joined near the costa on both wing and with a shaded patch at the junction.

Numeria pulveraria, L.—Local in woodlands, but widely distributed in the county; at Altadiawan and Favour Royal (K.), near Lissan, Stewartstown and Lough Neagh.

Ellopiæ (Hylea) prosapiaria, L.—Often abundant in pine woods, as at Favour Royal (K.), Lissan, near Killymoon, and Killycolpy Wood.

Metrocampta (Eudalimia) margaritaria, L.—Common almost everywhere in woods.

(To be continued.)

A SUPPLEMENTARY NOTE ON MACEDONIAN DRAGONFLIES.

BY HERBERT CAMPION.

MR. K. J. MORTON has been good enough to favour me with some additional observations upon the Odonata collected in Macedonia by Dr. J. Waterston (see 'Entom.,' vol. li, 1918, p. 128, and lii, 1919, p. 202).

It seems that the *Calopteryx virgo* of the country, of which specimens were taken at Stavros, belongs to the race *festiva*, Brullé, which was itself described from the South of Greece. In this variety the wings of the male are uniformly dark, and without the paler area at base and apex which is found in British individuals.

Of still greater interest is the discovery in the collection of a fourth species of *Orthetrum*. This is *O. albistylum*, Selys, a rare insect readily distinguished in both sexes and in all stages of development by the whiteness of its anal appendages. The single male and female were taken at Giol Ajak, near Milovçi, July to August, 1917, and were accidentally placed among the examples of *O. cancellatum* taken in the same year. Re-examination of the second female included in the same record shows it to have been correctly referred to the commoner species.

It may be useful to add to these remarks the dimensions, which have not been published before, of the ten specimens of *Selysiotthemis nigra*, Lind, in the same collection.

From Giol Ajak, July to August, 1917 :

	Abdomen.	Hind wing.
♂ No. 1	22·5	27·0
♂ No. 2	22·0	27·0
♂ No. 3	22·5	27·0
♀ No. 1	20·5	27·5
♀ No. 2	19·5	27·0

From Lake Adji Geul :

♀ No. 1	} June 18th to 19th, 1918 . . .	20·5	28·5
♀ No. 2		21·0	27·5
♀ No. 3		20·5	27·0
♀ No. 4		21·5	27·5
♂, August 4th, 1918 . . .		22·0	26·5

A NOTE ON SOME DRAGONFLIES FROM AMBOINA.

BY HERBERT CAMPION.

THROUGH the kindness of my friend Dr. Hugh Scott, I have had an opportunity of examining a small collection of Odonata

from Amboina, belonging to the University Museum of Zoology, Cambridge. These Dragonflies were obtained by Mr. Frederick Muir during his visit to that island in the year 1908, and as soon as caught they were immersed for a time in hot alcohol with the object of preserving their natural colours. To a considerable extent this object has been achieved, although the colours have obviously undergone a certain amount of bleaching.

According to a recent faunistic catalogue (Ris, 'Nova Guinea,' xiii, Zool. (2), pp. 117-128, 1915), *Pseudagrion microcephalum*, Ramb., has not been known previously to occur in the Moluccas at all, while *Xiphiagrion cyanomelas*, Selys, *Teinobasis superba*, Hagen-Selys, and *Trithemis festiva*, Ramb., are now specially recorded for Amboina for the first time.

Subjoined is a list of the species represented in the collection :

CALOPTERYGIDÆ.

Rhinocypha terminata, Selys, 4 ♂, 1 ♀.

AGRIONIDÆ.

Caconeura moluccensis, Selys, 7 ♂, 2 ♀.

Agriocnemis femina, Brauer, 3 ♂, 1 green ♀, 1 orange ♀. This record has been published by Dr. Ris ("Suppl. Entom." No. v, p. 23, 1916).

Xiphiagrion cyanomelas, Selys, 2 ♀.

Pseudagrion coriaceum, Selys, a series of males and females.

Pseudagrion microcephalum, Ramb., 2 ♂, 2 ♀. This species ranges from Bombay (the type locality) to Eastern Australia, and its occurrence in Amboina was not unexpected. I have compared a male and female from Mr. Muir's collection (the latter, however, rather discoloured) with Indian material of both sexes from Goa and Lake Chilka, kindly lent to me by Dr. F. F. Laidlaw. A close general agreement was found to exist, except in the matter of the superior anal appendages of the male, which are, of course, considerably broader in the Amboina specimen than in the examples from India. The various forms assumed by those appendages in *Ps. microcephalum* have been fully discussed by Dr. Ris (*loc. cit.*, pp. 40-42, 1916), but the appendages of the specimen before me do not strictly correspond with any of the figures given by him.

Teinobasis superba, Hagen-Selys, 1 ♀. For this identification I am indebted to the kindness of M. René Martin.

LIBELLULIDÆ.

Nannophlebia lorquini, Selys, 2 ♂, 3 ♀.

Nannophya pygmæa, Ramb., 1 ♂.

Neurothemis stigmatizans manadensis, Boisd. 2 ♀.

Trithemis festiva, Ramb., 1 ♂.

Dr. Scott has been good enough to make arrangements whereby some of these interesting Dragonflies have been acquired by the British Museum (Natural History).

ABISKO AND BOSSEKOP REVISITED.

BY ALBERT F. ROSA, M.D.

WHEN giving my experiences and recording the species of diurni I had met with while on a journey in Arctic Scandinavia in 1919 ('Entom.,' liii, pp. 109-115, and p. 131 *et seq.*), I had occasion to express regret that I had been unfortunate in being rather late for several of the more important species. This circumstance, which might happen with the most carefully-planned expedition, might depend entirely upon the forwardness of the season, or be due to unavoidable and unforeseen delays, and where several districts far removed from one another are included, it is almost certain that there will be some of the desired species on the wing at the same time in at least two of the localities included in the trip.

At the best, one rarely visits any region, and returns with a complete series of examples of all the species and varieties previously recorded; but, so far as Scandinavia is concerned, the season is so short and the facilities for travelling so favourable that it is rather extraordinary what can be done even in a very limited period of time.

So finding myself still short of several species, and in other instances rather deficient as to numbers of specimens, I thought a second round of these most interesting localities would be well worth making.

As I was later in starting than on the previous occasion, I had to pass Jemtland so as to be in advance of my former date. Crossing to Gotenburg, and stopping one day at Stockholm, I went right on to Abisko, where I arrived on June 16th, and found the district thawing after a severe snowstorm which had lasted several days during the previous week.

This state of affairs was greatly to my advantage, because I found the different species just emerging, and I was able on my first day, which was bright, to obtain specimens in the finest condition.

The temperature was very low, and there were no mosquitoes at this time. The smaller lakes were covered, or partly so, by a sheet of ice. The mountains were much whiter than on my previous visit, and snow patches still existed at a low elevation, as, for instance, along the line of the railway and even lower than the route to Björkliden by the side of the träsk.

Colias verdandi was not fully out, but made up in freshness

for its deficiency in numbers. *Brenthis freija* was in good condition, and it was not difficult to pick out examples newly on the wing, and *Erebia lappona* was just beginning to appear.

My second day was a blank for want of sunshine, but the third day was fine, and I was able to secure as many examples as I wanted of the species then on the wing. The variation of *verdandi* was much more marked than the year before, several males having the dark margin very faintly indicated. In other cases the series of oblong marks forming the marginal row was very strongly marked and the interspaces filled in with black, forming a continuous black marginal band. All degrees could be taken between these two forms.

Reindeer were common in the park, and I was a little surprised, on stepping through some bushes into the open, to find myself amongst a herd of twenty to thirty, the velvet still on their immature horns. They each made off in a series of graceful bounds as soon as they had recovered from their apparent astonishment.

I left Abisko on the 19th, and went to Bossekop, where I arrived on the night of the 22nd-23rd. When sailing north, a Danish couple, hearing where I was going, altered their journey. Originally intending to go to Vadsø, they had telegraphed for rooms at Bossekop, but on nearing their destination a reply was received saying there was no place where they could put up, and that the people of Bossekop did not want visitors.

This was rather disconcerting to them because they had just to return by the same boat, and to me also because I had hoped to stop at the hotel myself. I was sorry they had not spoken to me about it before embarking on the little steamer to Alten.

When landing I soon picked out Dr. Gjessing, wading about amongst the passengers on the fore-deck. He gave me a hurried welcome, saying he would "think about it." No conveyance could be got on hire, but, through the influence of the doctor, the minister's gig and pony were forthcoming, which the owner—whom I had met the year before—said he was pleased to let me have, and I was taken to Jørahl', where I ultimately got most comfortable rooms at a neighbouring farm about 2 a.m.

I was up betimes, and found the meadow facing the farm one of the most productive for *Colias hecla*—which was then just beginning to appear—that I had yet stumbled across. I only observed six on that, my first, morning; but next day, on going out, I got about a dozen in a few minutes, and every day while there I commenced operations by taking a short series.

I got one ♂ unusually strongly washed with violet, and another of a canary yellow colour, ab. *jöra*, n. ab.

Erebia polaris was newly out, and I found here very large *E. lappona* (48 mm.) and ab. *pollux*, Esp., which were also in the finest condition. *Eneis norna*, some very large, were often seen

flopping about, carried along by the strong wind, and *Chrysophanus* var. *hypophleas* also turned up here, but more ruddy than those taken at Hammerfest the year before. I also got some *Brenthis pales* var. *isis*.

During the few days I remained at Sletten, which was the name of the farm, my attention was centred on the moors intervening between the road and the Skadavaara, but the skies were often overcast during the principal part of the day, and the result of these incursions was anything but encouraging. The ground was very difficult to traverse; wide detours had often to be made to avoid the deeper swamps; the mosquitoes were terrific in their onslaughts. Occasionally a *Brenthis* would appear and disappear, without giving an opportunity to approach, and more rarely an *Erebia* would lure one into the deeper water, without so much as a chance of a sweep of the net.

For certain entomological reasons I wanted to be back at Abisko again as early as possible, so planned to leave Sletten on the Sunday, when "mine host" had agreed to drive me down to Bossekop.

On my last day, which commenced very dull during the forenoon, I made a last search in quest of *E. disa*, and at a point where the marsh crosses the main road I got *Brenthis* var. *fingal*, *B.* var. *ossianus* and *B. freija* commonly, and added *B. frigga* to my list, several of which were taken during the glimmers of sunshine. As the day brightened I made a detour to the left, and found *E. disa* sparingly (7 in all) but not in good condition in some of the swamps, which with little exaggeration might be termed lakes, dotted with tussocks of grass, springing from somewhere below, which give little or no support, and as the insect flies over the surface, one has just to go in up to the knees to get within reach.

As arranged, I was driven down to Bossekop on Sunday morning (27th), and during the forenoon wandered back to the farm down by the river. *C. hecla* was common in the meadows, still quite perfect here, and *E. polaris* by the side of the river. There are two rather curious forms of this, one which has a somewhat lighter ground-colour, greenish brown with dark dots scattered rather regularly over the surface, which gives them a peculiar granular appearance. The other form has symmetrical, pale, more or less wedge-shaped blotches on all the wings towards the medio-basal area. It is astonishing how frequently these two forms occur: one might almost say it is difficult to obtain specimens that are what one might consider normally unicolorous. All look very black when on the wing.

E. norna was frequently seen and taken, especially on the moors between the Alten elv and Bossekop village, and at the ford referred to in my former paper I saw my first Scandinavian *Melitæa*, which was quickly secured and proved to be a male of *M. iduna*.

I recognised the insect at once by its *Melitæa*-like flight, its dark colour and the white spots which identify it. It more closely resembles *M. aurinia* than it does *M. cynthia*, but there are no black dots in the submarginal series of fulvous spots, upper- or under-side. The pale (white) markings are more prominent on the under-side, and there is a strong black line separating them from the fulvous markings, which are much more restricted than in *M. maturna*. I was sorry I failed to locate its headquarters, though I had a good search all over the neighbouring ground.

I had dinner at the hotel, which was wholly occupied by Dr. Gjessing and his family while he was flitting from the district to Bodø, and I there was introduced to Dr. Wessel, who is the Fulkeslaege (chief doctor) in Finmark.

Dr. Gjessing was referring to my visit to Lapland when the elder gentleman asked me in English if I had taken '*charicle*,' and further showed his knowledge of the subject by inquiring if I had met with *iduna*, although no names had been mentioned.

The company was augmented by the arrival of the minister and one of the local dignitaries, when the sounding of the siren warned us of the arrival of the boat. The steamer left at 5 p.m. and I was back in Abisko in the evening of June 30th.

(To be continued.)

NOTES AND OBSERVATIONS.

PRODENIA LITURA, F.—Having observed this widely-distributed species at Funchal, Madeira, last December, I was led to look up its bibliography. To my surprise I find that the name will not hold, as it is based on *Noctua litura*, Fabr., 1775, not of Linné, 1761. We cannot revert to the commonly used name *littoralis*, Boisd., but must take up *Noctua histrionica*, Fabr., 1775—a quite suggestive name. The species, then, becomes *Prodenia histrionica*. At Villa Baleira, Porto Santo, in January, I took a quite ordinary *Xylina exoleta*, L. This genus is new to the Madeiran Archipelago.—T. D. A. COCKERELL.

EUVANESSA ANTIOPA IN SUSSEX.—In the evening of Saturday, August 20th, I left home for a short holiday. After lunch I went down the garden to see my head gardener to ascertain if there was anything to speak about before starting. He told me that he had seen a butterfly disporting itself over a large herbaceous border in the kitchen garden, and which was different to any he had ever seen before. He said it was a large, nearly black butterfly with a white edge all round. I asked him to stay where he was while I fetched a net and glass-topped box, and to watch it if he saw it again. I returned in about ten minutes, when he told me that he had seen it while I was away, and that it sat with its wings extended on a melon frame, but that it had gone again. We walked up and

down for quite half-an-hour when it came back, flew about the herbaceous border and then settled in an apple tree. I got close to it, tried to net it but the branch balked me. It flew wildly about for a few moments and again settled on another apple tree. This time I was more fortunate, and had secured the only Camberwell Beauty that I had ever seen alive in this country. It is a beautiful specimen. I set it before starting, and it is now safely in the cabinet. The next best British specimen in my cabinet was found by my wife. She entered a cottage near St. Osyth's in Essex to escape a heavy shower. In the fireplace she saw a sheet of brown paper with unset butterflies pinned all over it for a summer decoration. Among the Peacocks, Red Admirals, etc., she saw a Camberwell Beauty, which the old lady in the cottage told her she caught with the other butterflies in her front garden. The specimen had not, of course, been set out, but simply pinned through the body with the wings extended upwards at an angle of about 45 degrees. After telling the old lady that the insect was rare and valuable, and giving her a small present, she told my wife that if she would leave our address she would send some more. Needless to say this promise has never been fulfilled. Why the species is so rare in this country I cannot understand, as I have often seen it abroad, *e.g.* in Norway, South Europe, Canada, etc.—FREDERICK J. HANBURY; Brockhurst, East Grinstead.

CHRYSOPHANUS PHLEAS, VAR. ALBA, IN SUSSEX.—Baron J. A. Bonck informs me he captured on May 26th last a perfect specimen of *Chrysophanus phleas*, var. *alba*, on his shoot near East Grinstead, where he found *phleas* common, and also succeeded in taking several light-coloured examples, as well as different forms of var. *caruleo-punctata*. Although *C. phleas* has occurred abundantly in certain restricted areas in various localities during the past month or six weeks, it has been exceedingly scarce in S.E. Essex in places where it is usually abundant. The scarcity is due to insufficient food supply for the larvæ, owing to the dried-up state of all low-growing herbage, including dock and sorrel, through the continued drought. In this part of Essex no rain sufficient to moisten the ground fell between April 17th and September 11th, resulting in great destruction of insect life.—F. W. FROHAWK; October, 1921.

PYRAMEIS ATALANTA AND P. CARDUI IN LANCASHIRE.—*P. atalanta* has been extremely abundant in the Witherslack district this season, and also around Preston. Some 150 butterflies which I bred from larvæ collected in these two districts produced a few specimens of ab. *fracta* and other minor vars., the colour of their bands varying from dull orange in the case of one specimen to deep carmine. One specimen had the marginal band on the hind wings shading off from the normal colour to yellow on the margins of the wings. The butterflies were plentiful here on the flowers of Michaelmas daisies, and I took a specimen of the ab. *klemensiewiezi*, Schille, on September 10th quite near home. On September 17th and 18th, at Witherslack, I found *atalanta* swarming on some patches of Scabious, there often being seven or eight on the flowers within the space of a square yard. A careful search for varieties resulted in only one of any

note being secured out of many hundreds which were examined while they sunned themselves on the flowers. This was a specimen taken on September 17th with the fore wings asymmetrically marked, the left fore wing having a large broad projection from the inner edge of the red band near its middle, reaching half-way down towards the middle of the hind margin, exactly as we see in *P. indica*, in other respects and the right side entirely as usual in *atalanta*. *P. cardui* larvæ were plentiful on thistles at Witherslack in late July. I collected about 150, and the resulting butterflies included two or three with very dark hind wings, very little of the light ground colour being seen in one or two cases. The butterflies were common on September 17th and 18th, but by no means as abundant as *P. atalanta*.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston, October 6th, 1921.

PYRAMEIS ATALANTA IN BERKSHIRE.—In view of the interest attached to *P. atalanta*, it may be worth recording that this butterfly in very much in evidence along the banks of the Kennet at present. Apparently this species was uncommon here during the summer, as my earliest record is September 4th.—A. STEVEN CORBET; Sidmouth Street, Reading, October 5th, 1921.

BRENTHIS SELENE, SECOND BROOD, IN HAMPSHIRE.—In reply to Mr. H. Worsley Wood's query in the October issue of the 'Entomologist,' the following notes may be of interest: I specially looked for second broods of *Brenthis selene* in all its known localities in the Southampton district both in 1920 and in 1921. In the former year not a single specimen was met with, but this year in one locality there has been a numerous second brood, first seen on July 21st, which was, I think, almost as plentiful as the spring emergence; while in another locality eight or ten specimens only were found. It is worthy of notice that there was no second brood seen in any one of the many localities in woods. May I add, while on the subject of second broods, that on October 3rd I took at light one specimen of *Ourapteryx sambucaria*, of which five others since have been taken, while on October 4th I took one *Porthesia similis* ♂ also at light, of which species I have since taken four others, all males and very much smaller than usual.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

EVERES ARGIADES IN THE NEW FOREST.—While in the New Forest last August my son captured what he at the time supposed to be a specimen of *Argiolus*, but when he came to set it up discovered that it was *Argiades*. As this seems to be a very rare species I thought the record might be interesting.—W. ARTHUR LONG; 21, Guy Road, Beddington, Croydon.

SATYRUS MEGERA TREBLE-BROODED.—I first noticed the second brood of this butterfly (at Hazeleigh in Essex) on July 17th this year, and from then for about a month longer it was quite common; after that only one or two very worn specimens occurred. Judge of my surprise, therefore, when I noticed a fresh male in my garden at the Rectory on September 24th. During the next few days I

observed several quite freshly-emerged specimens, and among them on September 28th a paired couple, of which the female was carrying the male. A third emergence of this Satyrid in England I imagine to be quite unparalleled.—(Rev.) GILBERT H. RAYNER; The Lilacs, Brampton, Huntingdon, October 9th, 1921.

[I saw two or three specimens of this species on the Essex coast, between Clacton and St. Osyth Marsh, each day from September 28th to October 6th this year.—R.S.]

COLIAS HYALE IN KENT.—On September 6th I caught one specimen of *Colias hyale* at Westgate in a lucerne field. During my fortnight's holiday I did not see any more *hyale*, although the weather was superb, but *Pyrameis cardui* and *Chrysophanus phlæas* were fairly common.—H. O. WELLS; Inchiquin, Epsom, September 27th, 1921.

DEIOPEIA PULCHELLA IN LONDON.—On October 9th I captured a specimen of *Deiopeia pulchella* in Regents Park, London. It was flying close to the ground and settling frequently on grass stems. Although it moved on whenever I got near it never flew more than a few yards before dropping into the grass again, so I succeeded in boxing it at last. The specimen is a male and in perfect condition.—C. N. HUGHES; 178, Clarence Gate Gardens, Regents Park, N.W. 1.

DEIOPEIA PULCHELLA AT EASTBOURNE.—I think it may interest you to know that I have captured a specimen of *Deiopeia pulchella*. I found it on a football ground in bright sunshine, and was about to leave it for a cabbage white, when I noticed its peculiar flight and secured it, though badly damaged.—H. PHILLY; Aldro School, Eastbourne, October 11th, 1921.

NOTES ON *SPILOSOMA URTICÆ*.—In May and June last I reared a series of *Spilosoma urticæ*, the specimens ranging from forms without or with but one spot on the fore wings to those more or less spotted. Amongst the latter is a specimen which attracted notice by reason of the spot markings not being symmetrical. With eyesight not so good as it used to be, I found the male specimens not easy to distinguish at first sight from the female, there being a not very great difference between the antennæ of the two sexes, although when viewed through a magnifying glass such difference is quite apparent. When so viewed the asymmetrical specimen to which reference is made above was found to be an hermaphrodite, the right antennæ being male, the left female. On August 13th one specimen emerged, the ovum having been laid in June.—ALAN DRUITT; Willow Lodge, Christchurch, October 11th, 1921.

PORTHESIA SIMILIS IN OCTOBER.—It may interest readers of the 'Entomologist' to know that two freshly emerged examples of *Porthesia similis (auriflua)* were captured to-day in *côpula*.—N. CHARLES ROTHSCHILD; Ashton Wold, Oundle, Northamptonshire, October 8th, 1921.

TRIPHÆNA PRONUBA, AB.—On July 23rd this year I took a specimen of this moth at rest in the house. Colour of fore wings a very deep chocolate-brown; the usual markings can be seen, though some of them are indistinct. Hind wings smoky black, darker in the black borders and pale smoky yellow at bases. Thorax and body same colour as fore wings. The whole of the underside dark, with purplish tinge.—H. O. HOLFORD; Elstead Lodge, Godalming.

OURAPTERYX SAMBUCARIA IN OCTOBER.—Whilst collecting at ivy blossom on the evening of October 10th I captured a Swallow-Tailed Moth (*Ourapteryx sambucaria*) in fairly good condition—I presume a second emergence.—S. N. CHARTRES; 4, King's Drive, Eastbourne.

ABERRATIONS OF COCCINELLA BIPUNCTATA.—In walking from Harrow to Pinner on September 20th last I had occasion to cross a footbridge over the North-Western Railway. On the brickwork at one end of this bridge a large number of ladybirds were noticed, whilst others were alighting thereon. Curiosity induced me to examine the specimens, with the result that I selected twenty aberrations in about half-an-hour. These were ab. *bisculata* (7), *unifasciata* (1), *inequalis* (2), *annulata* (1), *pantherina* (2), *6-pustulata* (4), and *4-maculata* (3).—RICHARD SOUTH; 4, Mapesbury Court, Brondesbury, N.W. 2.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*October 5th, 1921*.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The President announced that owing to the illness of Mr. H. Rowland-Brown, M.A., Dr. H. Eltringham, M.A., D.Sc., F.Z.S., had kindly consented to act as Secretary for the remainder of the session.—The Treasurer called attention to two portraits that had been bequeathed to the Society by the late Dr. Longstaff.—A vote of thanks to Mr. J. J. Joicey, F.L.S., F.Z.S., F.R.G.S., for his generous gift of a lantern to the Society was passed unanimously.—The following were elected Fellows of the Society: Messrs. Charles L. Fry, 1621, Vallejo Street, San Francisco, California; William F. N. Greenwood, Lautoka, Fiji; Henry W. Dobson, 14/16, Finkle Street, Kendal; Kalidos D. Shroff, Nahani, Surat, India; Arnold Roebuck, Edgmond, Newport, Salop; the Rev. J. Wesley Hunt, 116, Cross Street, Kroonstadt, Orange Free State; and Miss Amy Castle, Assistant Entomologist, Dominion Museum, Wellington, New Zealand.—*Exhibits*: Mr. E. E. Green, F.Z.S., communicated an extract from his journal on the habits of the bee, *Anthidium manicatum*.—Mr. T. L. H. Grosvenor exhibited some British species of *Zygena*, and remarked on the results of crossing certain species and varieties.—Dr. Cockayne, M.A., F.R.C.P., commented on the question of

the identity of *Zygæna tutti*.—Prof. E. B. Poulton, D.Sc., F.R.S., etc., exhibited an example of *Danaïda chrysippus* that had been captured and subsequently rejected by a young shrike in South Africa; he also exhibited on behalf of Dr. R. C. L. Perkins, F.R.S., a collection of terrestrial insects taken from the stomach of a trout in Devonshire. Mr. M. E. Mosely expressed surprise that such a large amount of surface-food had been taken.—*Papers*: The following papers were read: "On *Boreus hyemalis*," by Mr. C. L. Withycombe; "Some apparently new S. African Genera and Species of the Family Pyralidæ," by Mr. A. T. J. Janse; "The African Species of the Genus *Neptis*, Fab.," by Dr. H. Eltringham, D.Sc., M.A., F.Z.S.; "The Number of Joints in the Antennæ of Haliplidæ and Paussidæ (Coleoptera)," by Mr. T. G. Sloane; "Observations on the Structure of some Homoneura, including the Diagnosis of Two New Families of Lepidoptera."—Mr. A. T. J. Janse gave an account illustrated with lantern-slides on methods of collecting insects when travelling in S. Africa.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—*September 8th*, 1921.—Mr. K. G. Blair, B.Sc., F.E.S., President, in the Chair.—Mr. H. Moore exhibited a nest of *Vespa germanica* from Kent, with 1052 dead wasps, another 100 or 200 in the nest and several dozen grubs still alive.—Mr. T. H. Grosvenor, several hybrid Zygænidæ from *Z. trifolii* taken in cop with *Z. hippocrepidis*, various forms of *Z. trifolii*, including ab. *nigricans*, ab. *obscura*, a white specimen, very large and very small specimens, confluent spotted forms, with minute sixth spot, with wide border to hind wings, etc., and of *Z. filipendulæ*, very large and very small forms, confluent spotted forms, several fine yellow forms, etc.—Mr. Hy. J. Turner, males and females of race *poseidon* and race *hecuba* of *Ornithoptera priamus* from Queensland and Key Island respectively.—Major Cottam, the chalk form of *Plebeius ægon* from N. Kent, *Euchloë cardamines* with yellow hind wings, very pale *Hypocrita jacobææ*, etc.—Mr. Syms, *Chrysomela graminis* from Yorkshire and *C. banksi* from the Isle of Wight.—Mr. K. G. Blair, the living larva of the sawfly *Eriocampa ovata* with its waxy secretion, and the living subapterous grasshopper *Leptophyes punctatissima*.—Numerous reports were made on the season and a discussion took place on immigration.

September 22nd.—The President in the Chair.—The evening was devoted to the demonstrations on a long series of lantern-slides by various members—Mr. H. Main, slides of the various phases in the life-history of the oil-beetle *Meloë proscarabæus*, a parasite in the larval stage of the *Anthophora* bee. Practically the whole of the details of the biology of the beetle were illustrated.—Mr. Withycombe, slides showing the habit, structure, growth and development of the bladderwort, *Utricularia*, which entraps small crustaceans and larvæ in water, and of *Pinguicula*, which captures and digests small insects by means of its leaves.—Mr. G. T. Lyle, slides of details of Lepidopterous structure, habits and development.—Mr. Bunnett, slides of various larvæ and imagines, etc.—Mr. Dennis, a slide of the ova of a *Cimex*, sp., etc.—HY. J. TURNER, *Hon. Editor of Proceedings*.

EXCHANGE.

The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, currency, or good condition of the Species. This Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused. *Marked * are bred.*

NOTICES OF EXCHANGE should be received by the 21st of EACH MONTH to insure insertion. Not more than SIX LINES can be allowed for each.

Wanted. Northern species. *Duplicates.* Nictitans, Leucophaea, ab. marionaria, Amantia, E. autumnaria, Consortaria, Boreata, Borata, Lota.—S. N. A. Jacobs, 5, Exbury Road, Catford Hill, S.E. 6.

Duplicates. Griseola, Velleda var. galliens, Phlegmitis, Rana, Leucostigma, Puta, black Agathina, Glareosa, Lanthina, Aurago, Soldanum, Querennaria, var. doublevaria, black Pedana, black Repandea, dark Gemmatia, Progenimaria var. fuscata, Ulnata, Dubitans, Morana, Fusca, V. annularia, Palcana, Spousana, Betuletana, Sauciana, Neglectana, Gerungana, Consortaria, Icteriana, Myrtillana, Congelatella, etc. *Desiderata.* Many local Macros, Pyralides, Pierophori, Crania, Tortrices and Tineæ. B. Mearns, Wood Mill, Ashmuthorpe, Huddersfield.

Duplicates. Cinxia, Bellargus, Corydon, H. comma, Lincola, Gentia, Moneta, Nuptia and many others. *Desiderata.* Eumonia, Irish Leontis, Carmentis, Cecilia, Gonostigma, Asworthia, Templi, Australis, Umiculata, Smaragdina, Teutacea. — W. J. Newell, 22, Cardoben Street, Poplar, E.

Desiderata. Numerous, and local species. W. J. Newell, 22, Cardoben Street, Poplar, E.

Duplicates. Varleyata, brick red Tiliæ vana, Athalia, melane, Consonaria and Abruptaria, and most of the British Macros. *Desiderata.* Hyda, Simpis, Blandina, Davus, Sibylla, Salmaeis, Rhana, Cassiope, Porocinus, Convolvuti, Stellatarum, Lagimperia, Esculi and many others; also paper Annia, Porcellus, Tilia (wild or dog), Calluna, Cardamines, Carpiui and many others. Liberal exchange. — W. J. Newell, 22, Cardoben Street, Poplar, E.

Duplicates. Numerous, and local species. W. J. Newell, 22, Cardoben Street, Poplar, E.

Desiderata. Numerous, and local species. W. J. Newell, 22, Cardoben Street, Poplar, E.

Duplicates. Numerous, and local species. W. J. Newell, 22, Cardoben Street, Poplar, E.

Desiderata. Numerous, and local species. W. J. Newell, 22, Cardoben Street, Poplar, E.

CHANGE OF ADDRESS. Mr. H. McD. Fitch, 10, O'Connell, Parkside Road, 47, you may find this.

TO CORRESPONDENTS. All notes, papers, etc., sent to the Editor of Exchange should be sent to the Editor.

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDES-BURY, N.W. 2.

CONTENTS.

A New Aberration of *Arctia astrarche*, William Carter, 249. *Colias edusa*, Fab. (*Oreoclus*, Fourn.): Its Seasonal Forms, Varieties and Aberrations, H. Rowland-Brown, M.A., F.E.S., continued from p. 187), 251. South American Linnepians. Mostly of the Group Colepini, Fred. C. Lewisitch continued from p. 236), 253. Three New *Stephanida* from Java, E. A. Elliott, F.E.S., 256. The Macro-Lepidoptera of County Tyrone, Thomas Giner continued from p. 208), 258. A Supplementary Note on Macedonian Dragonflies, Herbert Osborn, Entomologist, 256. A New very Common European Aquatic Butterfly, Henry D. Burdett, 262. A New and Old European Flycatcher, Alexander J. S. Rehn, 267.

THE 'ENTOMOLOGIST' SYNONYMIC LIST OF BRITISH LEPIDOPTERA.

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The Exchange List (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

“ ENTOMOLOGIST ”

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, **1s.** each, double numbers, **2s.** each; 1915 and 1916, **9d.** each, double numbers, **1s. 6d.**; 1917 and 1918 (January out of print), **1s. 6d.** each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at **15s.** each; 1915 and 1916 at **10s. 6d.**; 1918, **15s.** Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.

Any size to order. Satisfaction guaranteed. Sample Drawer on application.

APPARATUS.

**LARGE STOCK of Store Boxes,
Setting Boards, Larvæ Cages,
Pins, Nets, etc., etc.**

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,

4.3 SPRATT-HALL ROAD, WANSTEAD, E. 11.

*Subscriptions for 1922 (12s.) are now due and should be sent to R. South,
4, Mapesbury Court, Shoot-up Hill, London, N.W. 2.*

Vol. LIV.]

DECEMBER, 1921.

[No. 703.

THE
ENTOMOLOGIST

AN

Illustrated Monthly Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY RICHARD SOUTH, F.E.S.

WITH THE ASSISTANCE OF

ROBERT ADKIN, F.E.S.

W. J. LUCAS, B.A., F.E.S.

H. ROWLAND BROWN, M.A., F.E.S. CLAUDE MORLEY, F.E.S., F.Z.S.

W. L. DISTANT, F.E.S., &c. DR. D. SHARP, F.R.S., F.E.S., &c.

F. W. FROHAWK, F.E.S., M.B.O.U. N. D. RILEY, F.E.S.

C. J. GAHAN, D.Sc., M.A., F.E.S. W. G. SHELDON, F.E.S., F.Z.S.

"By mutual confidence and mutual aid
Great deeds are done and great discoveries made"

LONDON.

ADLARD & SON & WEST NEWMAN, LTD.,

BARTHOLOMEW CLOSE, E.C. 1.

Double Number.

Price Two Shillings and Sixpence Net.

WATKINS & DONCASTER

NATURALISTS,

Keep in Stock—

Apparatus and Cabinets

Required by Collectors of Insects, Birds' Eggs, Plants, etc.

A Large Stock of
British, Continental & Exotic Lepidoptera
and also
Birds' Eggs
(Singles as well as in Clutches).

OUR CATALOGUE WILL BE SENT POST FREE ON APPLICATION.

36, Strand, London, W.C. 2.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies, first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

SELL: Machaon, Lagustra, Oechatus, Tiber, Populi, Elpenor, Bombyliformis (narrow border), Lanestrus, Versicolor, Carpin, Bucaspis, Eucula, Vinula, Fagi, Curtula, Pigea, Batis, Orion, etc. Also Tutt's 'British Lepidoptera,' 5 vols.; 'British Noctua and their Varieties,' 4 vols.; Seitz 'Macro Lepidoptera,' 130 parts; Morris's 'British Butterflies and Moths,' 5 vols.; South, ditto, 3 vols.; and others. Particulars from—

A. FORD, 36, IRVING ROAD, BOURNEMOUTH.

Fine Noctuae, at per each: Flavicornis, Comma, Moneta, Suspecta, Upsilon, Glaucosa, Munda, Gracilis, Miniosa, 2d.; Lunigera, Fibrosa, Croceago, Tineta, Littoralis, Exolota, Neglecta, Pudorina, Phragmitidis, 4d.; Ophiogramma, Socia, Tychnitis, Putrescens, 6d.; Obscureta, Festuca, Cracca, Depuncta, 9d.; Occulta, Guenii, Ahu, 1s. Pupae: Lanestrus, Verbaaci, Carpophaga, 1s. 9d. & z., etc.

A. J. SPILLER, CHINNOR, WALLINGFORD.

THE ENTOMOLOGIST.

VOL. LIV.]

DECEMBER, 1921.

[No. 703

SEVEN NEW MOTHS FROM THE PHILIPPINES.

By A. E. WILEMAN AND RICHARD SOUTH.

Pangraptica (?) albistigma, sp. n.

♂. Head and thorax greyish brown; abdomen greyish brown, ringed with darker except on anal segments. Fore wings pale brown, suffused with darker and traversed by three blackish bands, the outer two curved and almost parallel; reniform and orbicular white. Hind wings whitish with blackish discal dot and broad terminal border. Underside paler, markings fainter, but discal spot of hind wings black and followed by a dusky curved line.

♀. Rather paler in colour.

Expanse: ♂, 28 mm.; ♀, 30 mm.

Two specimens from Manila, prov. Rizal, Luzon (sea level). The male was captured on July 19th, and the female on August 23rd, 1912.

Laelia (?) nitida, sp. n.

Head, thorax and abdomen white; antennæ pale brown, shaft white; front legs pale brown. Fore wings silky white. Hind wings and underside of all wings white.

Expanse: ♂, 32-36 mm.; ♀, 44 mm.

Two males from Palali, subprov. Benguet, Luzon (2000 ft.), December 28th, 1912; a female was secured at the same place two days earlier.

Comes nearest to *L. impressa*, Snellen.

Nygmia argentimarginata, sp. n.

♂. Head and thorax brownish buff, antennæ pale brown with whitish shaft; abdomen brownish buff, paler towards tip. Fore wings yellowish buff, with silvery markings between veins on terminal area. Hind wings above, and underside of all wings paler.

♀. Agrees with the male except in having the hind wings fuliginous with pale buff fringes; it is also larger. Underside fuliginous with pale buff margins.

Expanse: ♂, 22 mm.; ♀, 32-34 mm.

One male and two female specimens from Kolambugan, subprov. Lanao, Mindanao (sea level). The male taken June 16th, and the females May 26th and 30th, 1914.

Allied to *N. fulvonigra*, Swinhoe, from the Solomons.

Nygmia philippinensis, sp. n.

♂. Head and front of thorax straw yellow, rest of thorax tinged with purplish brown. Abdomen purplish brown, yellow towards tip. Fore wings straw yellow, basal patch purplish brown, tornal spot black. Hind wings and underside of all wings yellowish white.

Expanse: 32 mm.

A male specimen from Palali, subprov. Benguet, Luzon (2000 ft.), December 26th, 1912; and a male (type) from Kolambugan, subprov. Lanao (sea level), May 16th, 1914.

Comes near *N. cheela*, Swinhoe, from Singapore.

Nygmia biguttulata, sp. n.

♂. Thorax chocolate brown, head and front of thorax paler, antennæ brown; abdomen blackish, anal segment yellowish. Fore wings chocolate brown, a white spot at lower angle of cell and one below on vein I; fringes marked with white at ends of the veins. Hind wings blackish brown on basal two-thirds, terminal third yellow. Underside as above, but without white spots on the fore wings.

Expanse: 68 mm.

A male from Palali, subprov. Benguet, Luzon (2000 ft.), December 27th, 1912.

Allied to *N. præcurrens*, Walker.

Nygmia flavomarginata, sp. n.

♂. Head, thorax and abdomen pale purplish brown; antennæ pale brown. Fore wings pale purplish brown, apical area yellow, enclosing a black dot near apex, a yellow patch on termen above tornus. Hind wings pale purplish brown, termen broadly yellow; fringes of all wings yellow. Underside pale yellow, clouded with purplish brown on disc of fore wings.

Expanse: 22-24 mm.

Two male specimens from Palali, subprov. Benguet, Luzon (2000 ft.), December 25th, 1912.

Near *N. scintillans*, Walker.

Nagoda cardinalis, sp. n.

♂. Head, collar and pectus crimson; thorax and abdomen fuliginous. Fore wings fuliginous. Hind wings hyaline, costa broadly fuliginous, dorsum broadly blackish; termen narrowly blackish. Underside as above.

Expanse: 34 mm.

A male from Palali, subprov. Benguet, Luzon (2000 ft.), December 28th, 1912.

THE NORTH AMERICAN SPECIES OF *ORNEODES*.

By E. MEYRICK, B.A., F.R.S., ETC.

LORD WALSHINGHAM first recorded *O. hexadactyla* from the United States, and this identification has been accepted until

recently, and confirmed by other records. In 'Ent. Mo. Mag., vol. lv, p. 108 (1919), I recorded *O. Huebneri* from Canada. A careful monograph of the *Pterophoridae* of North America, with joint authors, Barnes and Lindsey, has just been published ('Contributions to the Natural History of the Lepidoptera of North America,' vol. iv, no. 4); to this is attached also the family *Orneodidae* (under the name of *Alucitidae*), including (in the judgment of the authors, who had copious material) one species only, which they term *Alucita montana*, Cockerell, with some hesitation as to its distinctness from *hexadactyla*; they had apparently not noticed my record of *Huebneri*. The name *montana*, Cockerell, has no validity; Cockerell never described it, and in the only reference quoted ('Ent. Mo. Mag.,' vol. xxv, p. 213) he is actually not even proposing the name, but withdrawing it as synonymous with *hexadactyla*. Dr. Lindsey has, however, been good enough to send me four Californian specimens from the material used for his paper; these are unquestionably not *hexadactyla*, and after careful and detailed comparison with *Huebneri* (of which, besides my European examples, I have a series from South Africa, a specimen from Kashmir, and two from Canada), I have satisfied myself that they cannot justly be discriminated from it. There is in the species some variability and diversity of colour and marking, and the scale-thickening of the dark band on the terminal joint of palpi is also rather variable, but I am unable to detect any constant distinction associated with particular regions, and the variation is no more than might be expected in so wide a range of distribution. My conclusion from the above evidence is, then, that there is only one North American species known at present, and that this is *Huebneri*. The apparent absence of endemic species in North America is curious and unexpected, since the genus is fairly well represented in South America, and the geographical origin of these latter species becomes a difficult problem; it may provably be African.

Synonymy of North American Pterophoridae.

In the careful paper to which I have referred above I notice certain species which the authors, whose studies have been generally restricted to the North American fauna, have failed to recognise as known elsewhere. Feeble as is the flight of the *Pterophoridae*, not a few species are nearly cosmopolitan in range, apparently without suspicion of artificial introduction. I had already called the attention of the authors to one or two cases of identity, which are incorporated in their paper, but the following are additional corrections.

Platyptilia crenulata, Barnes, is a synonym of *brachymorpha*, Meyr., which occurs throughout Africa, Southern Asia, and the Hawaiian Islands.

Platyptilia marmarodactyla, Dyar (of which the authors kindly sent me six specimens), is a synonym of *fuscicornis*, Zell., common in South America and the Hawaiian Islands. I note also that one of Walsingham's figures of *cosmodactyla* ('Pterophoridae of California and Oregon,' pl. ii, fig. 4) is certainly this species, the different position of the scale-tooth of hindwings and other characters being accurately given.

Pterophorus (*Oidæmatophorus*) *linus*, Barnes, is a synonym of *Lienigianus*, Zell., ranging through Europe, Southern Asia, Africa, and South America.

I take the opportunity to add my decided opinion that *shastæ*, Wals., and *fragilis*, Wals., are synonyms of *Platyptilia albida*, Wals. (examples were also sent me); the authors, whilst keeping them separate with hesitation, produce no distinctions that I should consider of specific value, and admit that apparently all three forms occurred in a long series from the same locality; we do not find in nature three distinct but indistinguishable species occurring together.

Thornhanger,
Marlborough.

NOTES ON THE SYNONYMY OF *DIONE MONETA*, HÜBN. AND *D. GLYCERA*, FELD.

BY ARTHUR HALL, F.E.S.

Dione moneta was first figured by Hübner (1820-26), his type being probably from South Brazil. The species occurs in three slightly but distinctly different subspecies, two of which are very common in collections, whilst the third, which happens to be the typical one, is rather rare, and this fact has caused considerable confusion in its synonymy.

Doubleday and Hewitson (1848) gave a figure which seems to represent the Central American race.

Butler (1873), having apparently never seen typical *moneta*, thought that Hübner's figure was intended to represent the species afterwards described by Felder as *D. glycera*, and so re-named *moneta* as *D. poeyii*. He united the Central American and Andean races under this name, but as he specifically refers to Doubleday's figure, the name *poeyii* may stand for the Central American race.

Salvin and Godman (1882) correctly identified the species, although evidently a little puzzled by the absence of typical specimens, as they suggest that Hübner's figure is bad, whereas it is in fact very good. They also unite the Central American and Andean races under the name of *moneta*, and treat *poeyii* as a synonym.

Stichel (1907) correctly separates the species into three races, giving the name *butleri* to the form occurring in Venezuela,

Colombia, Ecuador and Peru, but he wrongly assigns Costa Rican specimens (which belong to *poeyii*) to *butleri*, and gives the locality of true *moneta* as Bolivia and Upper Amazon, whereas specimens from those districts are in fact referable to *butleri* or are intergrades.

Seitz (1913), who seems doubtful about the distinctness of *D. moneta* and *D. glycera*, has figured *poeyii* under the name of *butleri*, and refers to *poeyi* (*sic*!) as a Cuban form in which the fore wings have the discal area lighter! This is altogether wrong, for I can find no record of Cuban specimens of *moneta* and much doubt whether the species occurs in that island.

It is remarkable that none of the above-mentioned authors seem to have known of the existence of *D. moneta* in the area which the typical form actually does inhabit, namely, Northern Argentina and the extreme south of Brazil. This typical form differs from the other two races in the much lighter colouring of the upper surface, the base of the fore wings being scarcely or not at all darker than the discal area and the discal black spots being vestigial or absent. In January, 1920, I met with it sparingly near Santa Maria in Rio Grande do Sul, and in the following month I found it very abundant at Salta in N.W. Argentina at elevations of from 2000 to 3500 ft. Many of these specimens agree absolutely with Hübner's figure, thus disposing of the idea that the latter was intended to represent *D. glycera*, but a few of the Salta examples are transitions towards the form *butleri*, although never so dark as those from Colombia and Ecuador. The butterflies have a flight similar to that of the larger *Argynnis*, but frequent flowers by the roadside and damp places on the ground; they are never found in the dense forest. In Colombia I have taken the form *butleri* at an elevation of 4500 ft., and rarely near Caracas at 3500 ft., but in both countries it probably occurs much higher. In Central America the form *poeyii* occurs, according to Godman and Salvin, from near sea-level up to 8000 ft., but personally I have never met with it below 3000 ft.; on the other hand I once took several examples on the Volcano of Cartago in Costa Rica at nearly 10,000 ft.

D. glycera is a very similar but smaller species of much more restricted range, occurring only in Venezuela, Colombia, Ecuador and Peru. The type was from Venezuela, and Stichel has recently separated the Colombian race under the name of *Gnophota*, but the characters upon which this is founded are so slight that it is doubtful whether the name can be maintained. Specimens from Ecuador and Peru are in any case similar to those from Colombia. The species is found as low as 3000 ft. in Western Ecuador (Huigra), and as high as 8000 ft. above Medellin in Colombia, flying at the same time of year as *moneta* var. *butleri*. Whether *D. glycera* is fully distinct from *D. moneta*

can only be determined when the early stages are known, but as the records seem to show conclusively that it cannot be either a geographical, seasonal or elevation form, it is probably a good species.

The principal synonymy of the two species will therefore be as follows:

1. *D. moneta*, Hübn., Samml. Ex. Schmett., ii, p. 20 (1820-26).
D. poeyi, Weym., Stett. Ent. Zeit., 1894, p. 320.
 S. Brazil; N. Argentina; Paraguay.
- (a) *D. moneta butleri*, Stichel, in Wytzman's Genera Insectorum, pt. 63, p. 19 (1907).
D. poeyii (part), Butler, Ann. Mag. Nat. Hist. (4), xii, p. 227 (1873).
D. moneta, Staudinger, Ex. Tagf., i, p. 87 (1887).
D. glycera, Kirby (non Felder), Cat. Diurn. Lep. Suppl., p. 724 (1877).
 Venezuela; Colombia; Ecuador; Peru; Bolivia.
- (b) *D. poeyii*, Butler, Ann. Mag. Nat. Hist. (4), xii, p. 227 (1873).
Agraulis moneta, Doubl., Hew. Gen. Dinon. Lep., t. 22, f. 1 (1847); Godman and Salvin, Biol. Cent. Am. Rhop., i, p. 171 (1881).
D. butleri, Seitz, Am. Lep., i, pl. 84, fig. E 5 (1913).
 Texas; Mexico; Central America.
2. *D. glycera*, Felder, Wien. Ent. Mon., 1861, p. 102; Seitz, Am. Lep., i, p. 402 (1913).
Agraulis moneta, Boisduval (non Hübn.), Spéc. Gén. Lep., i, pl. 10, fig. 7 (1836); *Dione moneta*, Kirby, Cat. Diurn. Lep. Suppl., p. 724 (1877); Seitz, Am. Lep., i, pl. 84, fig. F 1, 2 (1913).
D. glycera gnophota, Stichel, in Wytzman's Gen. Ins., pt. 63, p. 20, pl. 2, fig. 4 (1907); Seitz, Am. Lep., i, p. 402 (1913).
 Venezuela; Colombia; Ecuador; Peru; Bolivia.

DESCRIPTIONS OF THREE NEW BUTTERFLIES FROM COLOMBIA.

BY ARTHUR HALL, F.E.S.

Actinote elena, sp. nov.

Exp. ♂ $2\frac{1}{8}$, ♀ $2\frac{3}{4}$ in.

Allied to *A. surima*, Schaus, and *A. perisa*, Jord. Wings very pale yellow, highly transparent, with scarcely any traces of a dark marginal border. Fore wings with macular discal band almost as in *A. surima*, but its upper portion distinctly separated from the bar at the end of the cell; bar at middle of cell distinct. Hind wings with the discal band more macular than in *surima*, the spots composing it rounder; a small blackish streak in the cell. Underside as above, but paler, the markings fainter.

Habitat.—El Baldio, Colombia. ♂ ♀.
The sexes are alike.

Eresia callianthina, sp. nov.

Exp. ♂ $1\frac{7}{8}$ in.

Upper-side shining dark blue, the margins black. Fore wings with a large tritid basal patch of pale red, filling the whole of the cell, the basal half of the lower median interspace, and part of the middle median interspace, the part within the cell interrupted by a narrow black bar. Hind wings with the lower half of the inner margin red as far as the lower median branch. Underside yellowish brown with black veins and rays; red patch of fore wings more extended.

Habitat.—Santa Elena, W. Colombia, 8000 ft. 2♂♂.

Nearest to *E. neria*, Hew., but differs in its blue ground-colour and red inner margin of hind wings. It is a good mimic of *Actinote callianthe*, Feld., together with which it flies. My specimens were taken in July.

Eueides crystalina, sp. nov.

Exp. $2\frac{3}{4}$ to $2\frac{3}{4}$ in.

♂ ♀. Allied to *E. heliconioides*, Feld., but larger. Fore wings with the bone-yellow discal band broader than in *Heliconioides*, but lying wholly outside the cell, a few specimens only having a small dot of this colour within the cell; a red streak below median vein and another on inner margin. Hind wings with a broad median band of bright scarlet, occupying nearly half the wing, the outer edge of the band nearly semicircular and slightly serrated. Underside almost as in *E. heliconioides*, but the band of fore wings much broader and differently formed; hind wings with two submarginal series of small white spots.

Habitat.—Crystalina, W. Colombia, 1100 ft. (June and July).
14 ♂ ♀.

This species differs from *E. heliconioides* and its allies in the broad and solid red band of the hind wings, which is even broader than in *E. ricini*, L. It resembles *Heliconius clysonymus* on the wing, but I did not observe the latter species in the same district.

A FURTHER NOTE ON *COLIAS EDUSA*, FAB. (*CROCEUS*,
FOURC.): ITS SEASONAL FORMS, VARIETIES AND
ABERRATIONS.

By H. ROWLAND-BROWN, M.A., F.E.S.

By an oversight I omitted in my paper on *Colias croceus*, etc., to refer to the several notes on the species published by Prof. Cockerell in his papers "On the Variation of Insects" ('Entom.,' vol. xxii, 1889), *e.g.*—

(q) His var. *suffusa* is not Tutt's *suffusa* (1896). It is described as similar to the male figured in Newman's 'British

Butterflies' from the Bond Collection with the central area only of all the wings suffused with smoky brown, whereas Tutt's is a ♀ form "with strongly suffused base." Tutt's *suffusa* is, therefore, *nomen occupatum* and requires reconsideration. There are several smoky blotched examples in the Lowe Collection, but the apparent aberration here is due, I think, to some chemical process during relaxation.

(u) Ab. ♀ *pseudomas*, Cockl. (1889) = *obsoleta*, Tutt; the latter, therefore, falls to it.

Prof. Cockerell's vars. *major* and *minor* are not described in detail, and I see no reason to retain as separate forms in the strict sense. They are mentioned (*op. cit.*, p. 176) merely as instances of size variation.

On the other hand, my list must be extended and amended as hereunder in the light of his nomenclature:

(kk) *Micans*, Fritsche = *purpurascens*, Cockl. (*op. cit.*, p. 3), and is Fitch's ('Entom.', vol. xi) unnamed form, "beautifully shot with purple or blue." *Micans*, Fritsche, thus falls to the earlier name, while *Konas*, *micans*, if retained at all, should be limited to examples where the hind wings only are lustrous. Looking through my own collection I observe that, whereas the rosy lustre vanishes from *edusa*, it appears to be permanent in *hecla* and (purple) in *Aurorina heldreichi*, and probably others of the group.

(ll) Ab. *duplex*, Cockl. "Upper wings like *helice*, lower typical; or left side typical, and right *helice* ('Entom.', vol. xi, p. 52, and August, 1876)." Cp. Fitch's plate, 'Entomologist,' vol. xi, figures fifth in both columns.

(mm) Var. *angustior*, Cockl. Wings narrower and longer in proportion than in type (*op. cit.*, vols. xi and xxii, p. 148).

In conclusion I may add that I have a curious ab. of *helice* in which a series of white indeterminate scratches takes the place of the normal pale blotches in the black margin of the left upper wing, the right being normal. This example was taken by the late Rev. F. E. Lowe at La Granja, Spain, in June, 1908.

October 28th, 1921.

ABISKO AND BOSSEKOP REVISITED.

BY ALBERT F. ROSA, M.D.

(Concluded from p. 267.)

When changing boats at Hammerfest I had an hour or two to spare and so had a look for larvæ of *Aglaïs* var. *polaris* at the spot where it occurred the year before, but it was not to be found. If eggs had been deposited they had not hatched, as no webs were to be seen. I got a web of small larvæ when passing through Narvik—not, however, so likely to produce the variety

—and I also observed the larvæ of *Pyrameis atalanta* at the same place.

Six wolves were shot near Abisko jaure, which is a lake in the National Park Reserve, by a Lapp the day before I arrived, undoubtedly attracted by the deer, amongst which they do much damage, and often with no other object than the pleasure of killing. I was told that the lynx—*Felis borealis*—is still occasionally met with, sometimes far south, and its inroads amongst the herds is a much more serious matter. While on the subject I might mention that the ermine was common on the shore of the träsk about the motor landing-stage.

I collected at Björkliden and Lappporten at first, and got *Pieris* var. *bryoniæ* in beautiful condition, fresh out and common; *Brenthis freija* still going well, many perfect; and *B.* var. *finjal*, among others approaching the type *euphrosyne*; also *B.* var. *ossianus*, *B.* var. *arsilache*, *B.* var. *hela*, and added *B. thore* var. *borealis* to my list. The last was absolutely fresh and common on July 1st, though it was not long in getting worn, as it flies in the thicker bushy spots, alighting on the wild flowers growing in the marsh.

Larvæ of *Aglais* var. *polaris* were found at Björkliden behind a shanty where I found them in 1919. *Erebia ligea* was emerging. Some examples of the latter taken did not exhibit the normal rusty band and spots, there being a frequent tendency to these—the band and spots—being of a greyer shade, in one or two quite violet grey, which gives them a most remarkable appearance, the colour contrasting with the dark ground-colour.

Æneis norna here also, *Glaucopsyche* var. *cyparissus* mostly fresh and fairly common, and one large example of *Papilio machaon*, nearly 4 in. across. I also took *Colias palæno* var. *lapponica* before I left, and *C. werlandi* was still on the wing, some being fairly good.

Leaving Abisko I went on to Bräcke, and stopping at a place called Järpen, in Jämtland, for one day, I found the following species: *E. embla*, *B. frigga*, *B. ino*, very small, and *Nomiades semiargus* as well as *P. icarus*, *E. ligea* and one *Melitæa* not yet determined, probably *parthenie*, Bkh. The day was dull, or much more could have been done.

The original list of desiderata was as follows:

PIERIDÆ.—*Pieris napi* var. *bryoniæ*, forma *scandinavica*, *Colias palæno* var. *lapponica*, *C. nastes* var. *werlandi*, *C. hecla*.

NYMPHALIDÆ.—*Brenthis freija*, *B. frigga*, *B. thore* var. *borealis*, *B. aphirape* var. *ossianus*, *B. euphrosyne* var. *finjal*, *B. selene* var. *hela*, *B. chariclea*, *B. polaris*, *B. pales* var. *lapponica* et var. *isis*, *Aglais urticæ* var. *polaris*, *Melitæa iduna*.

SATYRIDÆ.—*Erebia embla*, *E. disa*, *E. (medusa* var.) *polaris*, *E. lappona*, forma *Scandinavica*, et var. *pollux*, *E. ligea*, forma *Scandinavica*, *Æneis jutta*, *Æ. norna*, *Æ. bore*.

LYCENIDÆ.—*Chrysophanus hippothoe* var. *stieberi*, *C. phlæas* var. *hypophleas*, *C. amphidamus*, *Latorina orbitulus* var. *aquilo*, *Glaucopsyche optilete* var. *cyparissus*, *Plebeius argus* (*argyrognomen*, var. *ægidion*).

HESPERIDÆ.—*Hesperia centaureæ*, *Augiades comma* var. *catena*.

Of these thirty-one I have taken twenty-seven in the two seasons. As to the remaining four, *B. chariclea*, which is very rare, has apparently never been taken by any British entomologist. The last recorded capture was by Schöyen in 1879. *Latorina orbitulus* var. *aquilo*, last record Schöyen 1879, also very rare.

I thought I had taken *B. polaris* near the Skadavaara, but the specimens (two) appear to be varieties of *freijsa*. Similarly with *C. bore*, I am afraid those taken must be referred to *C. norna*.

During the last season I have added to my list *B. frigga*, *E. disa*, *B. thore* var. *borealis* and *M. iduna*, the last never having been taken by a British collector. The locality (Alten) where it was taken appears to be a new one for the species. Herre Sparre Schneider gives only Sydvaranger. Schöyen took one example in the Porsanger Fjord in 1879. That it can be taken at Abisko I think has been substantiated, because I noted a ♀ specimen in the museum at Frescati which was marked "Abisko," and it appeared to be of recent date. I have also the word of Prof. Aurivillius that it does occur there; curiously enough, the Professor told me that he had never been to Abisko.

28, Pitt Street, Edinburgh.

THE MACRO-LEPIDOPTERA OF COUNTY TYRONE.

BY THOMAS GREER.

(Continued from p. 261.)

**Ennomos quercinaria*, Hufn.—Very local in woods at Lissan and near Killymoon.

**Ennomos alniaria*, L.—Not uncommon in birch woods at Lissan, Tallyhogue, and near Stewartstown.

Selenia bilunaria, Esp.—Generally common in the county; the var. *gulliaris*, Haw., occurs; Prof. J. W. Harrison remarks that the local form is much more richly coloured than North of England specimens.

Selenia lunaria, Schiff.—Very local at Favour Royal (Kane); two examples at light at Lissan.

Gonodontis bidentata, Clerck.—Generally abundant, varying from a pale biscuit colour to brownish black.

Himera (Colotois) pennaria, L.—Locally abundant at Favour Royal and Ballygawley (Kane); also near Lissan, Killymoon;

and about Stewartstown several males have the transverse lines very dark and the wings suffused with black scales.

Crocallis elingaria, L.—Common in woodlands.

Ourapteryx sambucaria, L.—Local and not abundant near Lissan, Tullyhogue, and at Stewartstown.

**Eurymene dolabraria*, L.—Very local at Lissan, Killymoon, and near Stewartstown; larvæ beaten from hazel and beech.

Opisthograptis luteolata, L.—Abundant everywhere. Prof. J. W. Harrison writes of local examples "very fine and clearly marked, much different from ours" (*i. e.* in Northumberland and Durham).

Epione apiciaria, Schiff.—Locally abundant and widely distributed in the county; sometimes appears in swarms at Killycolpy Wood together with another local species, *Evergestis straminealis*.

**Semiothisa liturata*, Clerck.—Local in pine woods at Lissan and Tamnamore, Killycolpy Wood, Lough Neagh.

Hybernia ruficapraria, Hb.—Very abundant along hedgerows in January and February.

Hybernia aurantiaria, Esp.—Local, but not uncommon, in birch woods near Lissan and at Killymoon and at Stewartstown; Mr. Kane also met with it at Favour Royal.

Hybernia marginaria, Bork.—Abundant and widely distributed in the county; a dark purple-bordered form occurs locally.

Hybernia defoliaria, Clerck.—Common in woods, and very variable; two examples of var. *obscurata*, Staud., near Lissan.

Anisopteryx æscularia, Schiff.—Generally common in the county.

**Phigalia pedaria*, Fb.—Local but often abundant at light at Lissan and Tullylagan; a fine large pale form; larvæ on sallow and sloe.

**Pachys (Amphidasys) strataria*, Hufn.—A single female at rest on a sallow trunk, Loughry; another bred from a larva beaten from wild cherry near Stewartstown, April, 1921.

**Pachys betularia*, L.—Common and widely spread in the district; larvæ on sallow, birch and sloe.

Boarmia gemmaria, Brahm.—Several examples in gardens at Stewartstown.

Boarmia repandata, L.—Generally abundant; ab. *destrigata*, Haw., not uncommon; strongly-marked forms with pale lines and blotches at Lough Fea.

Cleora lichenaria, Hufn.—Local but not uncommon at Trillick (K.); not rare near Lissan, Killymoon, and at Stewartstown.

Tephrosia crepuscularia, Hb.—Common at Favour Royal and Altadiawan (K.); also at Tamnamore; rare near Lissan.

Ematurga atomaria, L.—Abundant on moorlands and bogs.

**Bupalus pinaria*, L.—Locally abundant in fir woods at

Lissan, Killymoon and Tamnamore; a dark form of the male occurs in the latter locality.

**Selidosema erictaria*, Vill.—Local, but often not uncommon on the bogs at Lough Neagh, where a blackish streaked ab. *intermedia-fumosa*, Turner, and an almost black form, ab. *fumosa*, Mihi., occur.

Thamnonoma (Itame) wauari, L.—Not common at Favour Royal (K.); a few examples in gardens, Stewartstown.

**Lozogramma (Phasianæ) petraria*, Hb.—Abundant locally among bracken at Killymoon and near Tamnamore.

Chiasmia (Strenia) clathrata, L.—Locally common in meadows and on railway-banks; ground-colour silvery white, rarely yellowish; ab. *radiata*, Haw., near Tamnamore.

Scodiona belgiaria, Hb.—Not very common, but widely distributed in the county on the moorlands and bogs at Altadiawan (K.), near Lough Fea, and at Lough Neagh.

**Perconia (Aspilates) strigillaria*, Hb.—Abundant on the bogs at Lough Neagh, varying from a pale form to one approaching ab. *grisearia*, Staud.; banded varieties are also sometimes not uncommon.

ZYGENIDÆ.

Zygæna loniceræ, Esp.—Locally abundant in damp meadows; several specimens with the middle pair of spots confluent; one example with posterior wings partly orange; the larvæ only found on the meadow vetch, *Lathyrus pratensis*, in this district.

Zygæna filipendulæ, L.—Local and not always abundant; two specimens bred and one captured with the anterior wings pale steel blue, the spots and posterior wings pink, and the fringes of the wings whitish. Hybrids between this species and *loniceræ* occur in one or two localities; these have the borders of the posterior wings broad and undulating internally, and the sixth spot of anteriors very small; one example of this form has only four spots on the left wing, the lower spots of the outer and middle pair being entirely wanting.

**Ino (Adscita) statices*, L.—Not very common in damp meadows near Tamnamore and at Lough Neagh.

SESIIDÆ.

Trochilium crabroniformis, Lewin.—Larvæ abundant, infesting willow, poplar and osiers, and even dwarf willow on the moorlands at 900 ft.; a very small male bred from a larva found feeding in the "decayed" wood of a dead poplar tree.

HEPIALIDÆ.

Hepialus humuli, L.—Abundant in meadows; and in stormy weather often flying in little groups on the sheltered side of trees and tall hedges.

Hepialus velleda, Hb.—Some seasons very abundant and in others scarce; var. *gallicus*, Ld., almost as common as the typical form.

**Hepialus lupulina*, L.—Local but not uncommon at Killycolpy Wood on Lough Neagh and near Tullyhogue.

Hepialus hecta, L.—Abundant locally in damp woods in the district, and also near Favour Royal (K.); common in several localities where bracken is absent, the larvæ no doubt feeding in the roots of the male fern *Lastrea Filix-mas* or perhaps in a species of *Carex*.

SOME NOTES ON THE COLLECTION OF BRITISH MACRO-LEPIDOPTERA IN THE HOPE DEPARTMENT OF THE OXFORD UNIVERSITY MUSEUM.

BY F. C. WOODFORDE, B.A., F.E.S.

(Continued from p. 163.)

GEOMETRIDÆ.

THIS group has been arranged according to Mr. L. B. Prout's system worked out in Seitz's 'Macrolepidoptera of the World—Palearctic Geometridæ.'

The group is well represented, there being very long series of most of the variable species, and no species is entirely unrepresented.

Before going further I should like, on behalf of the Hope Department, to tender thanks to those collectors who have so kindly added to the collection since these notes were first published, and especially to Mr. Greer, of Stewarts Town, who has presented a most interesting lot of Irish insects, and the Rev. C. Ash, of Saxton Vicarage, who has done the same with Yorkshire insects, so filling up several gaps in localities which were before unrepresented. Several others have also added contributions. Even the commonest species from unrepresented localities are most welcome.

ÆNOTHERINÆ.

Aplastis ononaria.—A single specimen without data from the Spilsbury Collection.

HEMITHEINÆ.

The sub-family is well represented.

Two remarkable male specimens of *Hipparchus* (*Geometra*) *papilionaria* bred by Prof. Poulton have a very blue tint, and stand out very conspicuously in the series. They were bred from larvæ reared by him for experimental purposes (see 'Tr. Ent. Soc.,' 1888, pp. 592-5, and 1892, pp. 310-11).

ACIDALIINÆ.

Acidalia immorata.—A long series with full data.

A. rubiginata.—Series of 26, 9 with data.

A. floslactata (remutata).—A remarkable specimen from the Meldola Collection, labelled "Forres, May 20, 1913," has a grey ground-colour with a fairly distinct grey central fascia.

A. nigropunctata (strigillaria).—Twenty in all, 5 with data, from the Pogson-Smith Collection, one labelled "Folkestone, 16.7.98," three others "Folkestone, 23.7.00," and the fifth, "Folkestone, 28.7.00."

Ptychopoda (Acidalia) ochrata.—Series of 19, 9 of them from the Meldola Collection, labelled "Deal."

P. serpentata (perochraria).—One specimen without data from the Spilsbury Collection.

Ptychopoda (Acidalia) eburnata (Contiguaria).—A series of 21 with data, mostly from Penmaenmawr.

P. straminata.—Series of 17 from the New Forest taken by myself; 6 from the Champion Collection from Woking; 5 *circellata* without data from the Spilsbury and Sellon Collections.

P. herbariata.—Two from the Spilsbury Collection without data.

P. holosericata.—A long series with full data.

P. osseata (humiliata).—Series of 13 with full data.

P. degeneraria.—Series of 26 with full data.

Cosymbia (Ephyra) pendularia.—A long series of the type. A series of 80 from N. Staffs. ranging from pale almost typical specimens up to the darkest form of var. *subroseata*. Two bred from N. Staffs. var. *subochreate*, Wdfde., one being the original type (see 'E.M.M.' 1910, p. 114). One specimen (the type) of var. *orbiculoides*, Wdfde. (see 'E.M.M.' 1919, p. 103). One specimen var. *decoraria*, Newman (= var. *nigrosubroseata*, Bowman), from Oxshott.

C. orbicularia.—Series of over 30, mostly bred specimens from the New Forest.

C. annulata.—Three var. *obsoleta*, Riding; 2 var. *bi-obsoleta*, Riding, from the Meldola Collection.

LARENTIINÆ.

Rhodometra (Sterrha) sacraria.—Two specimens from the Spilsbury Collection without data.

Lithostege griseata.—Series of 24, 13 with data.

Oporinia (Oporabia) Christyi.—Three specimens from the Meldola Collection labelled "*O. Christyi*, Ireland, bred 1910."

Eustroma (Cidaria) reticulata.—Series of 16. Fourteen with full data. Six of the specimens were presented to the collection by the Rev. E. J. Nurse, and 2 by Mr. F. Littlewood. A larva,

pupa, and a dried portion of the food-plant, *Impatiens noli-metangera*, were also presented by Mr. Nurse.

Plemyria (Melanthia) bicolorata.—A fine series of Scotch forms from the Meldola Collection includes many var. *plumbeolata* and intermediate forms.

Cidaria (Thera) variata.—A fine series of about 40, bred and taken wild by myself and the late Major Robertson in Hampshire, clearly shows the distinctness of this species from *obeliscata*. Of this latter species there is a very long series from many parts of Great Britain.

Cidaria truncata.—A very long series of English and Scotch forms. From the Hope Collection are three of Haworth's specimens of var. *comma-notata*. One of them, labelled with his characteristic MS., is probably his original type.

C. concinnata.—Seven specimens from the Meldola Collection are labelled "I. of Arran." Five more from the same collection are labelled "Tarbert, Aug. 1914." These do not show so much rufous coloration as the Arran specimens.

C. immanata.—A long and beautiful series from England and Scotland. A Haworth specimen of var. *marmorata* from the Hope Collection, and so labelled in the characteristic MS., is probably his original type.

A specimen without data from the Spilsbury Collection of var. *thingvallata*.

Xanthorrhoe fluctuata.—A long series with many interesting aberrations. A specimen from the Meldola Collection is labelled "Dunbar, Aug. 12, 1912."

It is a most remarkable specimen, and at first sight it is difficult to believe that it belongs to this species, but on the whole the markings agree, and Mr. Prout has seen and confirmed it. The base of the fore wing is pale grey, bounded outwardly by a thickish black line corresponding to the outer part of the normal dark basal blotch. This is followed by a pale grey band intersected by three white streaks corresponding with or parallel to the veins. Beyond this rather narrow band comes the unusually broad central fascia of darker grey, rather wider than normal, and extending entirely across the wing, bordered on each side by a black line, which becomes less distinct towards the inner margin. Some of the veins in the fascia are white. The discal spot is distinct in the usual place. A distinct white line borders the outer black line, and both are much less indented than in a normal form. Touching the white line at the costa is a dark blotch extending to the apex of the wing, but partially broken by the whitish subterminal line. The outer part of the wing is grey except for the subterminal line. The fringes are spotted. The hind wings are pale grey, and have only two darker lines parallel to and near to the outer edges of the wings. The fringes

are spotted. The general aspect of the specimen is much smoother and much less mottled than normal.

Xanthorrhoe (Melanippe) montanata.—A specimen of var. *costovata* without data from the Spilsbury Collection.

X. (Coremia) quadrifasciaria.—A fine series of 22 from the Oxford district, of which 18 were bred and presented by Mr. C. Rippon. There are also 6 Surrey specimens from the Champion Collection, and 2 from Essex from the Meldola Collection.

Cidaria obstipata (fluviata).—Series of 36. Fifteen ♂, 21 ♀. Twenty-six with full data; 10 bred, from Paignton; 16 bred, from Bournemouth.

C. sagittata.—Series of 25. Eleven with full data.

Euphyia (Anticlea) cucullata.—Series of 40. Twenty-eight with full data; of these, 6 are labelled "Perth, bred from pupa, W. H. Horwood." Sixteen were bred by myself from a wild female taken by me at Paignton, August 1st, 1919. The female parent is also in the series.

Euphyia (Melanippe) unangulata.—Series of 30, 19 with full data, mostly from Surrey and Hants.

E. picata.—Series of 25, 12 with data from Hants and Surrey.

E. (Phibalapteryx) polygrammata.—Series of 11. One labelled "Cambridge, 1878," from the collection of the late Major Robertson. Eight from the Spilsbury and 2 from the Chitty Collections, without data.

Epirrhoe (Melanippe) sociata.—A very long series. One remarkable aberration taken by myself in June, 1920, on Cannock Chase is fully described, 'Entom.,' vol. liii, p. 286.

Perizoma (Emmelesia) teniata.—Nine specimens. Two with data. One from the collection of the late Major Robertson is labelled "Lynton, July 31, 1901." The other was taken by myself at Paignton, August 1st, 1919 ('Entom.,' 1919, p. 21).

Perizoma (Emmelesia) affinitata.—A remarkable specimen from the Sellon Collection labelled "Salway Collection" has an ochreous ground-colour instead of the normal dark brown. One specimen of ab. *turbaria*, St., from the Meldola Collection from Kent, Darenth Wood.

Hydriomena furcata (elutata).—A long and very varied series from many English and Scotch localities.

Eupithecia pini (togata).—Series of 38. Twenty-three with data, all Scotch.

E. irriguata.—The series of 26 includes 13 with full data, all from Hampshire.

E. insigniata.—A bred series of 10, labelled "Leominster, Mrs. Hutchinson." Four without data from the Spilsbury Collection.

E. palustraria (pygmeata).—Series of 11. Nine without data.

from the Spilsbury Collection, 2 labelled "Aberdeen, 1916," presented to the Collection by Mr. A. Horne.

E. venosata.—A long series, including 11 from Shetland with data.

E. trisignaria.—Series of 18, of which 4 from the Sellon Collection are labelled "Bred Burton, June, 1882."

E. helveticaria.—Twenty-one in series, including 12 from the Meldola Collection from Perth, with full data.

E. satyrata.—Series of 46. Thirty-six with data, including 12 var. *callunaria* and 8 var. *curzoni*.

E. tripunctaria (albipunctata).—Forty-three with full data and 8 without data, these last being from the Hope and Spilsbury Collections. In a series from Shropshire, bred by myself, is one specimen of var. *angelicata* entirely black, and another specimen very closely approaching, but with the white spot at the anal angle of the fore wing faintly indicated.

E. denotata (campanulata).—Series of 25 with full data from Worcester, Somerset and Sussex.

E. jasionata.—Series of 19 with full data, 9 of them from Cornwall. The remaining 10 are interesting, being bred by Mr. B. G. Adams and myself from larvæ taken feeding on the flowers of Canterbury Bells in his garden in Mid-Devon far from the sea in 1915 and 1917.

E. distinctaria (constrictata).—A series of 21 with full data—17 from Cornwall, 2 from Gloucester, 1 from Portland, 1 from Sligo.

E. extensaria.—Series of 16 with full data.

E. fraxinata and *E. innotata*.—Series of 19, 10 with full data.

E. virgureata.—Very poorly represented by a series of 6 from the Spilsbury Collection, without data. There were no specimens in any of the later collections.

E. debiliata.—A long series with full data from North Staffordshire, and 1 specimen from the Champion Collection from Surrey.

The genus *Eupithecia* is well represented on the whole, no species being without an example, and there are long series of most of the less rare species.

Cænocalpe (Phibalapteryx) lapidata.—Series of 21 with full data. Four from Sutherland from the Pogson Smith Collection, and 17 from Lanark from the late Major Robertson's Collection.

NOTES AND OBSERVATIONS.

AGLAIS URTICÆ, AB. AND CIDARIA IMMANATA, AB.—The following two varieties were captured by me at Gathurst near Wigan in July of this year, and seem worthy of being recorded. *Aglaïs urticæ*, an aberration, captured on the 11th, differs from a normal specimen as

follows—Upperside: Fore wing—red ground-colour deeper than usual, black terminal border very broad. Blue lunules almost obsolete, only represented by three diffuse patches of blue scales in centre of border. Yellow spots along costa absent, first from base being red, and second strongly suffused with black. White spot near apex less well defined and larger than usual and slightly suffused with black. Hind wing—usual yellow and red band from anal angle to costa represented by a deeper red oval patch traversed by black veins and not reaching vein 6. Underside fore wing—terminal border of dark striæ much broader than usual, usual grey-blue lunules absent. Hind wing—basal half black, outer half dark fuscous. Grey-blue lunules in terminal band present but smaller than usual, and not joined together. It was very distinct even in flight. *Cidaria immanata*, a form seen on 15th and captured on 18th is as follows: Ground-colour white. Central band and basal patch black. Usual dark markings beyond central band reduced in size. Hind wings normal. It seems to be referable to ab. *thingvallata*, Staud. It has a strong superficial resemblance to the black-banded form of *Lampropteryx suffumata*.—G. H. E. HOPKINS; Shevington Vicarage, near Wigan.

CÆNONYMPHA PAMPHILUS, VAR.—Whilst collecting near Padstow, N. Cornwall, in August, 1919, I took a variety of this insect similar to the second variety mentioned by Mr. Augustus E. Stafford ('Entom.', October, 1921, p. 242), namely with four dark spots along the outer area of the hind wing above. I have been unable to trace records of other similar varieties.—KENNETH J. HAYWARD, F.E.S.; Reservoir, Aswan, Egypt, October 14th, 1921.

CÆNONYMPHA PAMPHILUS, VARS.—With reference to the note on *C. pamphilus*, vars. (p. 242), by Mr. A. E. Stafford, I should like to reply to his question that on looking through my fairly long series of this butterfly from various localities, I fail to find *any* with "blind eye-spot at anal angle of hind wings," but several with "spots or points along the outer area." In those from Amasia and Broussa, in Asia Minor, only faintly indicated whereas in 2 ♀♀, one from Palermo, Sicily, and the other from Ain Zahalta, in the Lebanon, these spots are very distinct, and in the case of the latter, from Ain Zahalta, two on each wing are pupilled minutely with white.—M. E. FOUNTAINE, F.E.S.; 126, Lexham Gardens, London, W. 8.

PLEBEIUS (LYCÆNA) ARGUS = ÆGON; SECOND BROOD.—On October 30th I took one newly emerged male specimen of the above species in the New Forest between Lyndhurst Road and Beaulieu Road. Prolonged search by myself and an entomological friend failed to yield further specimens. Tutt says ('Brit. Lepid.', vol. x, p. 227) "in Britain the species is entirely single-brooded," and gives no date of specimens captured later than September 19th in the year 1877 (*loc. cit.*, p. 230). The species was flying in the greatest profusion in the New Forest on June 25th of this year.—WM. FASSNIDGE; 47, Tennyson Road, Southampton.

NOTES ON CYANIRIS ARGIOLOUS.—With reference to the Rev. G. H. Raynor's note in the 'Entomologist' for September I have to-day, October 16th, seen in my garden a specimen of *Cyaniris argiolus*,

evidently a third brood. I may mention that the first brood of this species from April 12th until the middle of May was extremely scarce, only two or three being seen, whereas the July brood was abundant—a most unusual occurrence in my experience.—A. H. JONES; Eltham.

THIRD BROOD OF *SELENIA TETRALUNARIA* (ILLUSTRARIA).—Among a second brood of larvæ of this species one individual fed up rapidly and pupated about August 15th, while none of the remainder were more than half grown. This produced a ♀ moth on September 11th, the specimen being rather smaller and considerably darker than the second-brood specimens.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston.

EUVANESSA ANTIOPA IN GLOUCESTERSHIRE.—On September 12th I took a fine specimen of *E. antiopa* in the Forest of Dean, in the Holly Wood near the Speech House. I have let the Bristol authorities see it, and they and all my friends have recommended me to write to you, as being the Editor of the 'Entomologist,' which I now do. I am a pupil at Clifton College.—IAN R. P. HESLOP; Thirlwell House, 34, Henleaze Gardens, Westbury-on-Trym, Bristol.

PYRAMEIS CARDUI AND *P. ATALANTA* IN EAST TYRONE.—Both these species have been remarkably abundant in this district during the past autumn, especially the latter. *P. cardui* was common during the month of September on scabious flowers, two males being captured with very dark hind wings. *P. atalanta* has occurred in hundreds at scabious and ivy bloom; several were observed in very fair condition on November 4th. Amongst a number of minor aberrations the following are worth recording: an example taken on October 24th with the marginal band on posterior wings shaded from pale red to yellow; another with the pale buff colour on under-side of posteriors much increased, the usual costal spot being extended to the outer angle of the wing; several specimens with the spot in marginal border of hind wings (next to the blue clouding), also of a blue colour.—THOMAS GREER; Curglasson, Stewartstown, Co. Tyrone.

MANDUCA ATROPOS AT ABERDEEN.—A good specimen of *M. atropos* was captured here, at light, on October 7th last.—L. G. ESSON; 6, Esslemont Avenue, Aberdeen.

SPHINX CONVULVULI IN SUFFOLK.—On Sunday, September 4th, 1921, Mr. Spencer Race of this town brought me a female of the above which he had just found sitting on the kerbstone (no lights near). I may add that I now have a fine series of this species, but strange to say I have never personally captured one of them. My first specimen was taken at the flowers of tobacco plant about 9.20 p.m., September 23rd, 1898, whilst myself and a friend were working for it; my friend was the lucky captor and gave the moth to me, as he already possessed several. Since then the remainder of my series have been made up by specimens brought to me by gardeners, etc.—HERBERT WM. BAKER; 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.

DARK VARIETY OF *ARCTIA CAIA*, L.—A colleague kindly gave me in July a bred variety of the common tiger moth in which the white of the fore wings is completely suppressed, leaving them chocolate-brown suffused with black. The hind wings are black with the usual dark spots clearly visible when the light glances on them; the inner margin, however, is, as usual, orange-tawny. The head, thorax and body are fairly normal. Unfortunately the specimen had been allowed to flutter in a small box all the night, so that it is now decidedly rubbed.—GEO. B. WALSH; 41, Gladstone Street, Scarborough.

DEIOPEIA PULCHELLA IN ESSEX.—I thought it would interest readers of the 'Entomologist' to know that a female specimen of *Deiopeia pulchella* in good condition has been captured. It was caught during the afternoon of October 19th in a locality in this town not far from the sea coast.—M. WRIGHTSON; Kenmore, Eton Road, Clacton-on-Sea.

PARASEMIA PLANTAGINIS, VAR. *HOSPITA*.—I took a specimen of this variety on the Longridge Fells, near Preston, on June 30th, quite close to where I took one last season; a few typical ♂♂ were seen flying, but they were scarcer than usual. *Vanessa io*, *Gonepteryx rhamni*, *Lycæna ægon*, *Cyaniris argiolus* and *Agrotis lucerneæ* were all very scarce at Witherslack this year, where usually they are all common, and *Aglais urticae* was by no means plentiful.—T. M. BLACKMAN; 27, East View Terrace, Fulwood, Preston.

MARGARODES UNIONALIS IN HANTS.—It may be of interest to record in the 'Entomologist' the capture of a perfect specimen of *Margarodes unionalis*, which I took in my garden here, at an Arbutus, on October 22nd last.—JOHN E. EASTWOOD; Wade Court, Havant.

COLIAS EDUSA, *C. HYALE*, ETC., ON THE SUSSEX COAST.—On the downs in the Shoreham and Worthing district the first brood of *Pararge megæra* appeared on May 9th, the second brood on July 18th, and it was last seen on August 20th. On September 30th a third brood appeared and has continued on the wing up to October 17th. *Agriades corydon* was plentiful by July 25th, and had doubtless been out a week when first observed. After September 7th none were seen until September 30th, when a male and female in perfectly fresh condition were taken and two freshly emerged females on October 5th. On September 28th four *Colias edusa* were seen and one taken. On September 30th one *C. hyale* was seen and taken; October 5th ten *C. edusa* seen, two taken; October 8th, seven seen, four taken; October 11th, four seen, three taken. On October 13th one *C. hyale* was netted on a bare stubble, but while the box was being prepared for its reception it slipped out under the net. On October 17th, on a steeply sloping bank facing south, I saw during an hour about six *C. edusa* and about twelve *C. hyale* flying together. One *edusa* was taken, and, as I supposed at the time, three *hyale*, but on subsequent examination at home one proved to be a very fine example of *C. edusa*, var. *helice*. One of the *hyale* is a very small

male and does not exceed 38 mm. in expanse. The next day I again visited the same place, but although it was an equally sunny day there was a strong breeze from S.E. and everything appeared to have been blown off the ground. Owing to prolonged absence from England I have not seen *C. hyale* on the wing since 1868, when I took it plentifully in Kent, and I remember it was over by about September 10th. Considering the date of the present captures I assume they are not recent immigrants, but bred in the locality, and I now feel convinced that I saw a single *C. hyale* in the same neighbourhood about the end of July.—CHARLES M. WOODFORD: The Grinstead, Partridge Green, Sussex.

SECOND BROODS IN 1921.—I observed several *Nisoniades tages* out on July 31st, rather pale in colour. On September 24th I netted *Brenthis selene* at Oakhanger; on September 24th *Ebulea sambucalis* came into the room—presumably a second brood. Is this unusual? I feel sure *Agrotis puta* had three broods here this summer. It comes commonly to light here, and this year as usual two broods came, of which I did not preserve the dates. But on October 1st two fine females quite fresh fell from ivy-blossom in my garden. *Acidalia virgularia* haunts the S.W. wall of the house all summer and was still coming in at the window up to September 24th. Under artificial conditions *Diacrisia sanio* commenced to emerge on August 21st, full-sized specimens; some larvæ died, but none showed any inclination to hibernate. I also raised a brood of *Nemophila plantaginis* from ova laid by a very pale ♀. They began to emerge on August 20th and some of the females are remarkably pale, the fore wings being cream with disconnected black spots, while the males are normal. They are undersized, however, and several larvæ ceased to feed. Since writing the above *Eupithecia albipunctata* has come to light (October 4th), *Porthesia similis* (October 6th), and *Cleora lichenaria*, a small specimen (October 8th). I once took an autumnal *P. similis* before, but I should think the others are rather unprecedented.—E. A. C. STOWELL; Eggars Grammar School, Alton, Hants.

PARARGE MEGÆRA TREBLE-BROODED.—In reference to the notes on *Pararge megæra* (*ante*, pp. 269–270) being treble-brooded, I may say that I saw near my home on the 16th ult. a perfectly fresh specimen of this butterfly. *P. megæra* is quite scarce enough in North Staffs at any time, but this record shows that there was very probably a third brood, and this as far north as any occurrences I have heard of.—THOMAS SMITH; Whiston Eaves, Froghall, Stoke-on-Trent, November 9th, 1921.

PARARGE MEGÆRA, ETC.—I thought it might be of interest to mention that a second generation of *Agrotis segetum* is nearly as common as the first in this district, and that the third broods of *Chrysophanus phlaas* and *Pararge megæra* are quite frequent. *Calocampa vetusta* seems to be not uncommon in the woods on this estate this autumn, where it is usually of very uncertain occurrence, if occurring at all.—R. GATTY; Ossemsley Manor, Christchurch, Hants, October 6th, 1921.

PARARGE MEGÆRA TREBLE-BROODED.—With reference to the Rev. Gilbert H. Raynor's note ('Entom.,' 1921, pp. 269–270) on the appearance of a third brood of this species at Hazeleigh, in this county, and his remarks that he thinks a third emergence to be "quite unparalleled," I can assure him that it is not so, for I have frequently observed third broods both here and in North Devon, and believe, when the seasons are favourable, they may be always expected. This year, in this neighbourhood, the first examples of the first brood were noticed on April 27th, and by May 10th they were out in abundance. The second brood were well out by July 22nd, when a large number of bright examples were seen. On July 30th, and again on August 5th, females were observed egg-laying. They were becoming much worn by August 22nd, and worn specimens were to be seen every time I looked for them up to September 16th. On September 18th a very fresh ♂ was noticed, and this, I believe, was the first of the third brood. By September 26th fresh examples were plentiful, and I saw them every day I went out. On October 13th I counted three dozen flying about the railway bank between Dovercourt and Parkeston. The last examples, two in number, were seen October 17th. At Instow, North Devon, I have already recorded ('Entom.,' vol. xlix, p. 287) that I saw one as late as November 13th, 1916. In 1917 I saw a number of fresh specimens on September 6th. In 1918, on August 11th, a large number were about, and on the morning of that day I must have seen at least a hundred flying by the roadside between Instow and Worlington House, a distance of about a mile. These might have been an early third, or a late second brood. Between October 13th and 23rd many more were seen, and these, of course, were a third brood. *P. egeria* is also treble-brooded in favourable seasons, and I frequently saw them at Instow at the end of September and early in October from 1916 to 1918. It does not occur here. *C. pamphilus* is another species that is constantly treble-brooded—or, perhaps, it would be better to call it continuously-brooded, for there seems to be a succession of broods. *E. jurtina* I have often seen very late in the season when out shooting. In 1917 I saw one as late as September 24th, so it looks as if this species was occasionally double-brooded.—GERVASE F. MATHEW, Paymaster-in-Chief R.N., F.L.S.; Dovercourt, November 15th, 1921.

SATYRUS MEGÆRA TREBLE-BROODED.—Regarding the Rev. Gilbert Raynor's note on the third brood of this species, he is in error by supposing those he observed to be quite unparalleled. It is usual for a third brood of *S. megæra* to occur in the year during fine warm summers, the first appearing in April and May, the second in June and July, the third in September and October. In the unusually fine and hot summer of 1893 a third emergence occurred towards the end of September and October. In 1911, another fine, warm summer, I met with a large number of freshly emerged specimens on the wing in Norfolk on October 18th. During September and October of this year examples of the third brood of this species were common in most districts I visited in S.E. Essex. In 1893 I bred a third brood of this butterfly from ova deposited on August 2nd; the

imagines emerged from September 24th to October 5th inclusive, but one remained as a pupa throughout the winter and produced a fine male specimen on April 26th, 1904.—F. W. FROHAWK; November, 1921.

WHAT IS *ZYGÆNA AB. HIPPOCREPIDIS*?—Can any reader inform me what is considered the true status of the aberration called *Zygæna ab. hippocrepidis*. My experience this season leaves me absolutely at sea. South, in his 'Moths of the British Isles,' is of opinion that it is a hybrid between *Z. filipendulæ* and *trifolii*. Now in this area I came across a large colony flying during the last week of May through June. I found all were typical *hippocrepidis* with wider marginal borders to hind wings, the sixth spot divided by nervule. I secured a long series and examined some two hundred others, and did not in a single instance find any with five spots only, though two had the sixth spot very small. The point is as the season advanced I found that many were absolutely type *filipendulæ*, exactly similar to others taken miles away in August. Again, among my *filipendulæ* taken over a series of years on our chalk down I find a few *ab. hippocrepidis*. Now if a hybrid, one would expect to find a colony, large or small, of both *filipendulæ* and *trifolii* near, but the nearest colony of *filipendulæ* is at least five miles away and no *trifolii* near at all. I have never seen a specimen of *trifolii* taken within, say, ten miles. How can we account for cross-pairing? I have in the past often seen what I considered *Z. filipendulæ* on the same ground but did not recognise it as *ab. hippocrepidis*, but this year, seeing it in such numbers, and at so early a date as the end of May, I examined them carefully and compared with type-specimens in my cabinet. It seems to me to be an aberration; but type is never found on the ground in August, and how account for the preponderance of the *ab.* in May and June. Again, if a hybrid, some few at least would take after the five-spotted parent. I would be very grateful if any reader having more experience than mine would write and give me information on this point, either through the 'Entomologist' or otherwise.—R. H. RATTRAY (Colonel); 68, Dry Hill Park Road, Tonbridge, Kent.

BUTTERFLIES ON THE SOUTH SALISBURY DOWNS, 1921.—The following notes on Rhopalocera, chiefly collected near the village of Damerham in South Wiltshire, may be of interest. *Gonepteryx rhamni*, *Vanessa io* and *Aglais urticae* were first seen on March 25th. *Pieris rapæ* first made an appearance on April 4th, and my first record for *Euchloë cardamines* was April 20th. During the hot summer all three species of *Pieris* were unusually abundant, and several diminutive specimens of *P. rapæ* were taken. *Argynnis aglaia* is usually fairly common, but this season only a single specimen was taken. I saw nothing of *Argynnis cydippe*, which was very plentiful here in 1919. Prior to 1919 I had not seen *Dryas paphia* on the downs, but this year it was fairly common everywhere. No specimens of var. *valesina* were seen. *Eugonia polychloros* is never common here, but I took a single specimen at Cripplestyle in July. *Pyrameis cardui* was more in evidence than usual, but *P. atalanta* was not seen at all. *Vanessa io* was much commoner than *Aglais urticae*: usually the

reverse is the case. *Pararge megæra*, *Epinephele jurtina*, *E. tithonus* and *Canonympha pamphilus* were all very common. *Hipparchia semele*, a very common insect in 1909-11, almost disappeared about 1914-15, but was about again in fair numbers. *Aphantopus hyperanthus*, another insect whose numbers were declining, was by no means uncommon this year. Nothing was seen of *Pararge egeria*, var. *egerides*, although it generally occurs in small numbers. *Zephyrus quercus*, formerly confined to one or two oak woods, appears to have extended its range. *Chrysophanus phlæas*, *Polyommatus icarus*, *Agriades corydon* were all common, and females of the last species seemed to be more in evidence than usual. *Plebeius ægon*, *Aricia medon*, *Cupido minimus* and *Celastrina argiolus* were all much as usual. Of the Hesperidæ, it is interesting to note that a partial second brood of *Nisoniades tages* occurred in early August. *Agriades comma* was unusually abundant in July. In April I found a larva of *Gastropacha quercifolia* which developed more than the customary number of white marks. In this case the food-plant used was apple. I took a specimen of *Charæas graminis* on August 4th—the first specimen I have seen in this locality.—A. STEVEN CORBET; 21, Sidmouth Street, Reading.

NOTES ON LYCENIDÆ IN 1921 IN NORTH KENT.—The last year having been so abnormal, the butterflies were equally so in many respects. Everything was very early, in most cases very numerous, and in some varied much more so than in other years. This being within easy distance of the chalk downs, limestone (Kentish rag) and the clay weald along the river bed I had great opportunities, and devoted practically the whole season to the *Lycenidæ*. I, of course, noted nothing new, but can confirm the conclusions come to by many others. of the effect of a very hot, dry season. Some species generally present in more or less numbers were absolutely absent. *Chrysophanus phlæas*, L., was very abundant, and ran to three large broods. First brood: I saw the first, a male, on May 9th; they were numerous, but not in any way varied. By the 27th of the month they were faded and much worn. On June 15th the second brood began to show up and onwards in increasing numbers: they simply swarmed everywhere. I at once noticed that the suffused forms were in large numbers; in one field on the outskirts of the town they were in excess of normal coloured. I secured a fine series of a form very dark, fore wing with very little copper showing, and the copper band on hind wing reduced to a mere thin line. Many had quite long tails, both in the suffused forms and normal type, with intermediates of all lengths. *Ab. cæruleo-puncta* was very common, quite 30 per cent. showing spots, and in most cases three to four spots and very large and bright. The third brood was first seen on August 30th; I have never seen the species so common—they were everywhere. This brood was most varied, and showed a great tendency to light-coloured vars. I took in one small corner, where I usually get one light brass-coloured in the year, at least eight, some with other variation combined. On September 12th I caught a perfect male with right side normal, left side both wings ab. *schmidtii*, a very pale clear straw colour, fringes on left side very pale. The following abs. were very much in evidence—*cæruleo-puncta*, *subradiata* and

intermedia. I also secured a pair of ab. *cupreo-puncta*. The colour of the normal types was very bright and deep copper. *Callophrys rubi*, L., was more than common, the first seen on April 30th quite freshly emerged. From this date on through May they were everywhere, and it was quite a common occurrence to catch three or four in one stroke of the net. I secured a nice series of undersides, ranging from fully spotted on all wings to two ab. *ceucus*, and one specimen with ground-colour a dull brown green. Many had a few light brown scales towards anal angle of hind wings, and some few a thin obsolete line, orange colour, just inside the anal angle. *Zephyrus quercus*, L., was absolutely absent. I searched some well-known haunts, but did not see a single specimen. *Celastrina argiolus*, L., was very scarce. They are generally common in all the gardens here, but I only saw one male of first brood and about six, including one female, in second brood. *Cupido minimus*, Fuess., was well out on the chalk at the end of May. I secured a good series on May 30th and June 2nd. They were very well scaled with blue. Unfortunately owing to distance I was unable to visit the ground during July or August, so cannot say whether there was a second brood or not, but owing to the heat all the food-plant was absolutely burnt up. *Plebeius ægon*, Schiff: both the chalk form, var. *cretaceus*, and the heather form are found near here. I could only have one day on the chalk downs, where var. *cretaceus* was out in great abundance, with many nice blue-marked females. I took a few of the beautiful form with well-marked orange-red lunules on all wings and blue wedges running up to the centre of hind wings. I also secured a few females without blue scaling, but a white line along the outer margin of hind wing between the spots and edge. The heather form was actually obtained just outside Kent area in Sussex. I saw the first, a male, on June 17th and caught eight. Between that date and the 23rd of the month they were very numerous and I secured a nice series, including one very blue female and one female of normal colour, but half of each wing light grey, the line sharply defined and quite symmetrical on both sides, the markings on undersides of wings showing clearly through the thin scaling. The fly was very early everywhere and absolutely normal in intensity of colouring. *Agriades bellargus*, Rott., was very early on the wing; I unfortunately missed the first brood, and only saw a few rags when I did visit their haunts. I kept a good look-out for second brood early and saw first a few males on August 4th. No females appeared till the 9th. The females of this brood were absolutely without any trace of blue scaling on any wings; they were all of a very dark blackish brown, with well-marked orange eyes on all wings. The eyes did not have any blue, but greyish-white markings near them. They in every way conformed with the type mentioned by Tutt as the normal form in hot, dry years. I last visited the ground on August 18th; they were then out in swarms, but practically all confined to a small corner in one field. *Agriades corydon*, Poda., was, like the rest, very early. Owing to an accident I was unable to visit the ground till July 18th; I then found them well out, many males showing wear, females few. They continued common till August 18th, but were absolute rags by that date. I found a good range of variation,

ab. *punctata* with well-marked eye-spots quite common, also a nice ab. *marginata* and another *subsuffusa*. Many of the males were of the pale sky-blue colour as against the silver blue of normal years. The females, as in *A. bellargus*, were with very little blue scaling: I only saw two with any amount of blue out of perhaps 100 examined. I found the colour a dark brown, not so dark as *A. bellargus*, and the normal blue scale replaced with light grey. This, again, I take it, is typical of the very hot season. Among the females ab. *parisiensis* was quite common, with well-marked deep black arch joining the two spots. *Polyommatus icarus*, Rott., was another species that showed a great difference in first and second broods; there was also a well-developed third brood in September. The first noticed was a male on May 23rd. From the 24th onwards they were in swarms everywhere. The females were of a particularly dark bright blue and well scaled. The blue females preponderated to a large extent; I only took two all-brown females and three or four with a few blue scales only. Ab. *melanotoxa* was common and well marked, but only in females; among the males were many underside ab. *flavescens*, the yellow being particularly pale coloured, in one almost white. The second brood was well out on July 14th and continued till the end of the month, when they were worn. The chief thing noted about this brood was the almost total absence of blue females. Out of more than 100 examined only two were well scaled and some twelve with blue scales at all. All were very dark fuscous brown with well-marked orange lunules on upper-sides. In males ab. *candiope* and *icarinus* were in about equal numbers. Another point was that in first brood, the underside in males was normal light coloured, in second was much darker, and in many cases the hind wings were a deep yellow-brown; I also took two male ab. *melanotoxa*. Female abs. were much as in last brood; I took two very fine dwarf ab. *minor* with well-marked *melanotoxa*. The difference in size between two broods was not of a marked character. The third brood appeared on August 30th, and was, though not so numerous as the other two, well marked. Both males and females of this brood were very small as compared to the others, nor out of some thirty females examined did I see a single all-brown specimen and two very deep all-blue females; all the rest were with blue scales well shown. Of the undersides nothing of note and no especial variation. *Aricia medon*, Esp., was not common in either brood; and the only point of notice was that the second brood was very small. I took one male of first brood with orange-red marks on upper side replaced by pale lemon spots. It has been a most interesting season, and in my opinion the most prominent is the dark colouring of females of all double-brooded species and absence of blue colouring in these and in *A. corydon*, thus showing the effect of a very hot, dry summer on colour.—R. H. RATTRAY (Colonel); 68, Dry Hill Park Road, Tonbridge, Kent.

DEIOPEIA PULCHELLA IN SUSSEX.—I have to report the capture of a Crimson Speckled Footman Moth (*Deiopeia pulchella*) on Beachy Head, on October 7th. It appears to be a female.—GERALD HUGH BROWN; The Swingle, Brenchley, Kent.

SOCIETIES.

THE ENTOMOLOGICAL SOCIETY OF LONDON.—*October 19th, 1921.*
 —The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The presentation by Mr. H. Donisthorpe of a drawing of Mr. T. W. Bates to the Society was announced, and a special vote of thanks was passed to the donor.—The following were elected Fellows of the Society: Messrs. H. J. Wilson, O.B.E., M.A., F.Z.S., 139, Bishop's Mansions, S.W. 3; Alexander John Nicholson, University of Sydney, New South Wales; F. N. Chasen, M.B.O.U., Assistant Curator, Raffles Museum, Singapore; Baron J. Bouck, Springhill, South Godstone, Surrey; and Percy A. Glick, 903, West Illinois, Urbana.—Mr. G. Talbot exhibited, on behalf of Mr. J. J. Joicey, new and rare Lepidoptera collected by Mr. Pratt in the Weyland Mountains, New Guinea, and also read a letter describing the country from which the specimens came.—M. F. Le Cerf, on behalf of Mr. J. J. Joicey, exhibited several new forms of African *Papilios*; comments were made on this exhibit by the President and Prof. Poulton.—Mr. W. G. Sheldon exhibited a series of 1300 specimens of *Peronea cristana*, including examples of all the 72 named forms; also a series of about 250 specimens of *Oxigrapha literana*.—Prof. Poulton exhibited examples of a form of *Heodes phlæas* from S.W. Uganda, and discussed its relations with *H. abbotti*. He read some details of the genitalia of these forms supplied by Dr. Chapman. He proposed to treat *abbotti* as a race of *phlæas*, and suggested the name "*ethiopica*" for the new race from Uganda.—Mr. Donisthorpe exhibited examples of *Gymmetron squamicolle* from Ireland; the pupa and larval skin of *Cassida nebulosa* taken on *Chenopodium album*; and larvæ, both dead and living, of *Trionodes hirtus*.—Mr. W. J. Atkinson exhibited examples of *Ips erosus* found breeding in the Forest of Dean, and read some notes on this bark beetle and on allied species.—The following paper was read: "New or Little Known Exotic Tipulidæ (Diptera)," by Prof. Alexander.—Mr. A. T. J. Janse gave a further account on methods of collecting when travelling in South Africa, illustrated with lantern slides.

November 2nd, 1921.—The Rt. Hon. Lord Rothschild, M.A., F.R.S., etc., President, in the Chair.—The presentation by the President of a rare copy of Scopoli's '*Delicæ Floræ et Fornicæ*' was announced, and a vote of thanks to him was carried with acclamation.—The following were elected Fellows of the Society: Messrs. Norman E. Miller, Dar-es-Salaam, East Africa; Oliver Richardson Goodman, 210, Goswell Rd., E.C. 1; K. P. U. U. Nair, M.A., Training College, Trivandrum; Frank Balfour-Browne, M.A., F.R.S.E., F.Z.S., Oaklands, Fenstanton, St. Ives, Hunts; E. Melville du Porte, M.Sc., Ph.D., MacDonald College, Quebec, Canada; Oliver C. Cassels, D.F.C., N.D.A., West Hill, Ottery St. Mary, Devon; O. C. Ollenbach, Survey of India Dept., Dehra Dun, India; J. B. Corporaal, Pieter Bothstraat, 39, The Hague, Holland; Douglas Cator, 13, Westminster Mansions, Great Smith Street, S.W.; Marco Pallis, Tatol, Aigburth Drive, Liverpool; and Samuel Walker, 53, Micklegate Hill, York.—Mr. W. G. Sheldon exhibited a series of *Epinephèle ianira* from Sutherlandshire showing an approach to var. *hispulla*; also *Pieris*

napi showing an approach to var. *bryoniæ*.—Mr. Bethune-Baker a series of *Zygæna filipendulæ chrysanthemi* from Birmingham.—Mr. F. W. Edwards a remarkable new insect from Kashmir, which, though probably representing a new family of Diptera, shows curious resemblances to the Mayflies.—Mr. L. Newman a gynandromorphous example of *Amphidasys betularia doubledayaria*, and an Ichneumonid parasite from *Sphinx ligustri*.—Prof. E. B. Poulton, F.R.S., the warble fly of the reindeer captured with its model *Bombus lapponicus anuræanicus*; he also read a note regarding observations made by Mr. Arthur Loveridge on the oviposition of the Mylabrid beetle *M. oculata*, Thunb., var. *tricolor*, Gerst.—Canon StAubyn Rogers, butterflies from East Africa, including remarkable females of *Papilio dardanus*; examples of *Papilio rex* and *Mimacræa marshalli dohertyi*.—W. A. Lambourne, an oriental Danaine butterfly brushing the brands on its hind wings.—Mr. G. Talbot, on behalf of Mr. J. J. Joicey, new and rare butterflies from New Guinea and Peru.—Mr. H. Donisthorpe, a rare British Aphid, *Stomaphis quercus*, L.—Mr. A. T. J. Janse concluded his account on methods of collecting while travelling in South Africa, illustrated with lantern-slides.

THE SOUTH LONDON ENTOMOLOGICAL SOCIETY.—October 13th, 1921.—The President in the Chair.—Mr. A. W. Vesterling, 107, Castle Street, Battersea, was elected a member.—Mr. Soar lectured on "The Hydracarina or Water-mites," and showing a large number of lantern-slides and coloured drawings of species and structural details.—Mr. Grosvenor, the chief palæarctic species of the genus *Zygæna*.—Mr. Blenkarn, the scarce weevil, *Epipolæus caliginosus*, from Dover.—Mr. Newman, *Rumicia phlæas* with ab. *obsoleta*, ab. *suffusa*, a golden form, and ab. *parvipuncta*. He reports *Euvanessa antiopa* seen by his son at Bexley.—Messrs. O. R. and A. de B. Goodman exhibited *Nordmannia ilicis*, var. *cerri*, and var. *æsculi*, with *Klugia spini*, having (1) straight white line below, (2) concave ditto, (3) and greatly widened ditto, all but the last two from Digne.

October 27th, 1921.—The President in the Chair.—Mr. J. A. Vernon, "Lynmouth," Reigate, Surrey, was elected a member.—Mr. H. Main exhibited a female *Scorpio europæus* with her family from Hyères and gave notes on the life-history.—Mr. Grosvenor had seen a N. Indian species carry its young similarly.—Mr. A. A. W. Buckstone, several local series of *Ematurga atomaria* from southern areas with var. *unicolorata* from Burnley, including a very dark form from Horsley and some pale yellow forms from Otford.—Mr. Barnett, larvæ of *Arctia villica* from Reigate and a varied series of Surrey *Rumicia phlæas*.—Capt. Crocker, long series of *Malacosoma neustria*, bred from two pairings from Otford, (1) all light with narrow band, (2) mixed light and dark forms. He also showed a very long series, including ab. *alba*, ab. *ignita*, ab. *intermedia*, ab. *obliterata*, ab. *cæruleo-punctata*, ab. *radiata*, ab. *turcicas*, ab. *suffusa*, and others with unmated and intermediate forms.—Mr. O. R. Goodman, ab. *navarina* of *Melitæa athalia* from St. Martin Vésabie.—Mr. Dennis, photographs of the English *Cimex lectularius* and the tropical *C. rotundatus* which had conspicuous sculpturing.—Mr. Turner read extracts of letters from Mr. G. B. Pearson in California, and showed

a specimen of *Echinocastus wisliczeni* from the Californian desert sent by him.

November 10th, 1921.—The President in the Chair.—Rev. R. E. E. Frampton, M.A., Halstead Rectory, Kent, and Dr. H. D. Smart, Shelly, Huddersfield, were elected members.—Mr. Laurence Chubb, of the Commons Preservation Society, gave a lecture with lantern-slides.—HY. J. TURNER, *Hon. Editor of Proceedings*.

LONDON NATURAL HISTORY SOCIETY.—Lepidoptera Section: October 18th, 1921.—Dr. Cockayne in the Chair.—Second broods of *Thera variata* form *obeliscata* and *Porthesia similis* were reported by Mr. Bell.—*Rumicia phleas* were exhibited by Mr. Riches, who had bred them out the previous month, and by Mr. H. B. Williams, who also showed a specimen of *Epinephele janira* with a whitish right fore-wing, and varieties of *Melitæa athalia*, *M. cinxia*, and *Abraxas grossulariata*.—Dr. Cockayne exhibited larvæ of *Epinephele tithonus*.—Paper read, "Notes on British Skippers," by Mr. H. B. Williams.

November 1st, 1921.—Dr. Cockayne in the Chair.—Mr. C. H. Williams showed a series with considerable variation in *Rumicia phleas*.—Dr. Cockayne exhibited *Sesia scoliæformis*, and Mr. Worsley Wood a good selection of *Brephos parthenias* bred from larvæ or taken in Surrey this year.—Paper read, "Distribution of *S. scoliæformis*," by Dr. Cockayne.—Plant Gall Section: Mr. L. B. Hall in the Chair.—Among the exhibits were galls caused by *Eriophyes atrichus* on *Stellaria graminea*, *E. euaspis* on *Lotus corniculatus*, *E. ilicis* on *Quercus ilex*, *E. macrotrichus* on *Carpinus betulus*, *E. pteridis* on *Pteris aquilina*, *E. tilix* var. *exilis* on *Tilia grandifolia*, *Perrisia bryoniæ* on *Bryonia dioica*, *P. carpini* on *Carpinus betulus*, *P. silvicola* on *Stellaria holostea*, *P. tubicola* on *Cytisus scoparius*, *Pemphigus filaginis* on *Gnaphalium uliginosum*, sawflies and Cecidomyidæ on various species of *Salix*, and *Beta maritima* swollen by larva of a micro-lepidopteron.—Mr. Hall recorded *Agropyron purgens* galled by *Isosoma graminicola*, a new host plant, found near Tilbury.—Paper read, "Notes on the Galls on Rosacææ," illustrated by specimens.—H. J. BURKILL, *Minuting Secretary*.

ENTOMOLOGICAL SOCIETY OF HAMPSHIRE AND THE ISLE OF WIGHT.—From small beginnings as the Southampton and District Entomological Society the above-named Society has grown. The change was formally made at a meeting held on October 1st, 1921, with the President, Mr. W. Fassnidge, M.A., in the Chair. With its now well-defined, if artificial, boundaries the Society should be able to make rapid progress with some of the objects it has in view. Prominent among the activities it now has in hand is the compilation of a county insect fauna list. Meetings will be held for the present, as formerly, at 47, Tennyson Road, Southampton, on the first Saturday afternoon in each month. Other meetings will be arranged in the future to be held from time to time in the larger towns of the county. An invitation is extended to every keen entomologist in the county to join the Society. Communications should be addressed to the *Hon. Sec.*, FREDK. J. KILLINGTON, 1, St. Catherine's Road, Eastleigh.

OBITUARY.

READERS of the 'Entomologist' will join in the great regret that all who knew him will feel in the passing away of Francis George Whittle, which took place on October 26th.

His end was tragic, but it was one which probably he—and for the matter of that many of us—would wish for, without pain, and apparently without premonition. He had taken his usual daily stroll along the sea front near his residence at Southend-on-Sea, with his fox terrier, to which he was much attached, and was found on a seat quite dead, the cause was heart failure. His faithful companion guarded all that remained of him, and it was an hour before the police could overcome its resistance. He had visited his friend the Rev. C. R. N. Burrows two days before his death, and was then apparently in his usual health and spirits.

Mr. Whittle was born at Highbury on August 31st, 1854, and would thus be in the sixty-eighth year of his age. For many years he occupied an important position in the Joint Stock Bank, retiring on a pension in 1913. Shortly after his retirement he went for a tour round the world, and was in Australia when the Great War broke out. His journey home was an exciting one, for the "Emden" was about, and the vessel he travelled in had to cross the zone of her activities; fortunately for him the German raider was avoided.

The subject of this notice was essentially a field naturalist, and few knew the habits and life-history of British Lepidoptera better, especially those of the Tineina, in which he specialised. From his long residence at Southend he probably knew more than anyone the many interesting species of Micro-lepidoptera frequenting the Thames marshes. One of his specialities was the extremely interesting psychid *Whittleia reticella*, of which he practically worked out the life-history. The generic name given by the late J. W. Tutt is, of course, in memory of him. Apart from his field work there are many notes in this and other magazines—principally accounts of his excursions or captures.

The summers of the last five or six years have been spent in the Scottish highlands, where he made many interesting captures, including a tortrix new to Britain *Ancylis tineana*, Hüb. (see 'Entom.', vol. liii, p. 12). The way he "stuck it" in those regions through the most appalling weather, and with the most primitive conditions of food and accommodation, from March to October, was eminently characteristic of the patient, determined, good-tempered, kindly nature of the man. He was the writer's companion for several happy and unforgettable weeks in West Sutherlandshire during the past summer.

Whittle was one of the most unassuming and diffident men the writer ever met, but when one got within the skin of the outer reserve, there was no one more generous, genial, or kindly natured. The following little incident will illustrate these qualities. Some time back he paid a week-end visit, and in running through my collections we discussed two species, of neither of which I possessed type—*Spilodes palealis*, formerly met with in the Southend district, and the very difficult to obtain *Catoptria nimbana*. Shortly after-

wards there came a box from him containing four beautiful *palealis*, and a very good *nimbana*. A few weeks passed and I spent a week-end with my friend, and found that there was a blank in his series of *palealis*, and in the place of the specimens until recently filling that blank there were *four pinholes in the paper!* Turning to the *nimbana* series I found it consisted of two specimens and immediately below those was a *pinhole!* One will never forget, too, his kindness at the famous collecting locality of Camghouran on the shores of Loch Rannoch in 1919, and especially the way in which he turned out of his room and moved into a much inferior one, so that his guest might have the best accommodation the small cottage he was staying in afforded.

It is understood that his extensive collections are bequeathed to the British Museum (Natural History), which should greatly benefit thereby, for all his specimens are accurately and fully labelled.

W. G. S.

WITH deep regret we have to record the death of Albert Bridges Farn, which took place at his residence at Ganarew, Monmouthshire, on October 31st last, in his eighty-first year, being born on March 19th, 1841. For some years his health had been failing, and finally an operation was found necessary, which was performed successfully in August. That gave him hopes of being cured, but to his intense disappointment he learnt the following day that it was only a preliminary operation, and that a more serious one would be compulsory at some future date, which never occurred. In his weak condition this must have been a great trial during his last few weeks of patient suffering. In his last letter to the writer, dated September 4th, 1921, conveying this sad state of events, he adds: "Of course I have done no collecting this season. To-day is a most glorious one, not a cloud to be seen and the sun intensely hot, many *Io*, two *Atalanta* and one *Urtica* (the only one I have seen this season) in the garden, besides the third brood of *Egeria*. . . ." Mr. Farn was not only one of the most learned students of British Entomology, but an accomplished all-round naturalist and a keen sportsman. As is well known to many readers of this journal, he specialised in British Lepidoptera, and during his long and vigorous life he formed the finest private collection of these insects in the country, surpassing that of the well-known collection formed by the late Sydney Webb. The Farn Collection is especially rich in the large number of remarkable varieties, and includes long series of many of our rarest species. He was a frequent attendant at the most important sales of British Lepidoptera held at Stevens' auction rooms, and at the death of Mr. E. Sabine in 1906 he acquired his entire collection, which was in itself an extensive one and contained a great number of fine varieties, including a wonderful lengthy series of *C. phlaeas*. The series of *C. dispar* is probably one of the finest in private collections, both as regards condition and the number of specimens (about 3 doz.), and includes one female, probably the largest example known. Among the extraordinary varieties, too numerous to mention, allusion must be made to the remarkable unique melanic *M. galatea* captured near Rochester in 1871.


Mr. Farn was not only a patient and keen observer, but a persevering and very successful collector. He was a frequent contributor to the 'Entomologist.' His first contribution appeared in the April number of vol. iv, for 1869, on "Critical Notes on Entomological Authors," occupying four and a half pages, in which he accurately alluded to the errors "in such books as Prof Westwood's 'Butterflies of Great Britain' and Mr. Stainton's 'Manual of British Butterflies and Moths.'" In June of the following year he contributed five pages on the "Silk Culture of Japan," followed by numerous contributions on various subjects, and records of the capture of rare and interesting species during subsequent years. In 1880 he revised and extended the third edition of the well-known 'Insect Hunter's Companion,' by the late Rev. Joseph Green.

Besides an entomologist Mr. Farn was a well-known ornithologist and recognised as a very first class shot, consequently he was a frequent guest at the big shoots of the late Lord Walsingham and other noted shots. As a snipe shot he has probably not been equalled, his record bag being thirty snipe in thirty consecutive shots. He was an expert in taxidermy and accumulated a choice collection of many of our rarer birds, obtained with his own gun, and admirably preserved in natural attitudes as observed by himself in life. He also formed a very extensive and valuable collection of eggs of all the British birds, including the rarest waders and other Arctic breeding species. During his later years he devoted much of his leisure in making faithful coloured drawings of a great number of eggs in his collection—a task he found at times somewhat difficult, and which the writer had the pleasure of assisting him to accomplish. Upon his retirement from official duties at Whitehall, where he held the important post of Examiner and Administrator of Vaccine, about twenty years ago, he moved from his rural home at Greenhithe to Hereford, chiefly with the hopes of turning up in some of its old localities the now supposed extinct (in Britain) *L. acis*, but without success. While residing there and giving up the more fatiguing sport of shooting he became a keen angler, and landed many fine Wye salmon. From Hereford he moved still further westwards, to Ganarew, in Monmouthshire, where he did a large amount of natural history research in spite of his flagging health. Mr. Farn was a man of extraordinary courage, determination and reliability; his word was the acme of accuracy and truth. His loss will be keenly felt by a large circle of friends, and by none more deeply than by the writer of these lines, after a friendship extending over forty years.

F. W. F.

EXCHANGE.

'The publication of Notices of Exchange, or of Advertisements, in the 'Entomologist' is in no way a guarantee for the British nationality, authenticity, or good condition of the Specimens. The Notice is not given to throw doubt on the bona fides of Exchangers or Advertisers, but to absolve the Editor from responsibility, in case the liberty allowed should be abused. *Marked * are bred.*

 **NOTICES OF EXCHANGE** should be received by the 21st of each Month to insure insertion. Not more than Six Links can be allowed for each

Duplicates.—Pupa: *S. ocellatus*. Imago: *Ocellatus*, *Tipuliformis*, *B. quereus* (very fine, 1 ♀, 1 ♂), *Nupta*, *Maura*, *Moneta*, *Flavocincta*, *Pallens*, *Mitura*, *Puta*, *Xanthographa* (various), *Pycnidea*, *Primaria* ♂ (3), *N. pronitata* (2), *Tersata* (second brood), *Decolorata* (4). *Desiderata*.—*Procellus*, *Promissa*, *Sponsa*, *Eucetiformis*, *Bombyliformis*, *Crabroniformis*, *Aptorinus*, and local Northern species. Black pins, full data and good condition only. *Herbert Wm. Baker*, 26, Woodfield Terrace, Ipswich Road, Stowmarket, Suffolk.

Duplicates.—*Selene*, *T. rubi*, *Blodina* ♀, *Rumicis* and var., *Salsis*, *Chi*, var. *Olivacea*, *Glaucia*, *Podaria* (melanet), *Latenta*, *Leucophaea* and var., *Carpinata*, *Tristata*, *Testata*, *Atrata*, etc. *Desiderata*. Very numerous to renew and extend. *G. Fleming*, 26, West Grove, Merthyr Tydfil.

Duplicates.—Ova: *Olivacea*, *Pennaria*, *Angularia*. Pupa: *Imotata*, *Bidentata*, *Dromedarius*, *Wanted*. Ova: *Tiaria*, *Erosaria*. Pupa: *Crepuscularia*, *Bimbularia*, *Rivata*, *Galata*. Imagines: "pugs," *Immanata*, *Grossulariata* varieties, *Mista*, *Siterata*, *Salsitata*, *Olivata*, *Prata*, *Munitata*, *Nigrofasciaria*, *Firmata*.—*H. H. Harrison*, The Avenue, Birtley S.O., Co. Durham.

Duplicates.—*M. capitumena*, *E. congelatella*, *P. variegana* (white var.), *Sauciana*, *Brunnichiana*, *Semifuscana* (6), *Oculta*, *Schulziana*, *Dorsana*, *Bacnana*, *Narana*, *Vacciniana*, *Strobilella*, *Incrustatana* (4), *Dinniana*, *Badiana*, *Baummanniana*, *D. salicella* (4), *Bertrami*, *T. corticella*, *Nervosa*, etc. *Desiderata*.—*Pyrales*, *Tortrices*, etc. *T. Ashton* Lofthouse, The Croft, Lofthouse, Middlesbrough.

Duplicates.—*Biedoriana*, *Convoluti*, *Mentanthidis*, *Dietaoides*, *Interrogationis*, *Thalassina*, *Cratzei* ♀, *Triplasia*, *Tincta* (dark), *Alternata*, *Mendica*, *Nupta*, *Urtica*, *Atalanta*. *Desiderata*.—*C. album*, summer brood only, with data. *B. W. Noce*, Lyndhurst, 95, Queen's Road, Brownwood Park, London, N. 4.

Duplicates.—*Selene*, *Sibylla* (dine), *Galathea*, *T. rubi*, *Egon*, *Corydon*, *Aetron*, *Hectus*, *Populata*, *Viretata* (dine), *Multistrigaria*, *Embria*, *Ambigua*, etc., etc. *Desiderata*.—*Dipometa*, *Populata*, and very numerous to replace; the rate would then only be 30. *A. H. Ellis*, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

To CORRESPONDENTS. All notes, papers, books for review, &c., and notices of Exchange should be sent to the Editor.

RICHARD SOUTH, 4, MAPESBURY COURT, SHOOT-UP HILL, BRONDESBURY, N.W. 2.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest Stations, South Kensington and Gloucester Road). *December 7th at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1. *Thursday, December 8th*, Ordinary Meeting at 7 p.m.—Hon. Sec., STANLEY EDWARDS, F.L.S., etc., 45, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Thursday*. Visitation welcomed at all meetings.—Hon. Sec., W. E. GILG, The House, Albion Brewery, Whitechapel Road, E. 1.

CONTENTS.

- Seven New Moths from the Philippines, *A. E. Wileman and Richard South*, 273.
 The North American Species of *Orneodes*, *E. Meyrick*, M.A., F.R.S., etc., 274.
 Notes on the Synonymy of *Dione moneta*, *Hübner*, and *D. glycera*, *Feld.*,
Arthur Hall, F.E.S., 276. Descriptions of Three New Butterflies from
 Colombia, *Arthur Hall*, F.E.S., 278. A Further Note on *Colias edusa*, *Fab.*
 (*Crocus*, *Faure.*); Its Seasonal Forms, Varieties and Aberrations, *H. Row-*
land Brown, M.A., F.E.S., 279. Abisko and Bossköp Revisited, *Albert F.*
Rosa, M.D. (concluded from p. 267), 280. The Macro-Lepidoptera of County
 Tyrone, *Thomas Greer* (continued from p. 261), 282. Some Notes on the
 Collection of British Macro-Lepidoptera in the Hope Department of the Oxford
 University Museum, *F. C. Woodford*, B.A., F.E.S. (continued from p. 163),
 285.
- NOTES AND OBSERVATIONS.—*Aglais urticae*, ab., and *Cidaria mimanata*, ab., *G. H. E.*
Hopkins, 289. *Cönonympha pamphilus*, var., *Kenneth J. Hayward* (Capt.),
 F.E.S., 290. *Cönonympha pamphilus*, vars., *M. E. Fountaine*, F.E.S.,
 290. *Piebus* (*Lycania*) *argus* —agon; Second Brood, *Wm. Fasshidge*, 290.
 Notes on *Cyaniris argolus*, *A. H. Jones*, 290. Third Brood of *Selenia illus-*
traria (*tetralunaria*), *T. M. Blackman*, 291. *Euvanessa atropa* in Gloucester-
 shire, *Ian R. P. Heslop*, 291. *Pyraus cardui* and *P. atalanta* in East
 Tyrone, *Thomas Greer*, 291. *Mameuca atropos* at Aberdeen, *L. G. Esson*, 291.
Spinx corymbia in Suffolk, *Herbert Wm. Baker*, 291. Dark Variety of
Arctia celsa, *L. Geo. B. Walsh*, 292. *Deilepora pulchella* in Essex, *M.*
Wrightson, 292. *Parassmina plantaginis*, var. *hepita*, *T. M. Blackman*, 292.
Margatodes anomalis in Hants, *John F. Pastwood*, 292. *Colias edusa*, *C.*
hyale, etc., on the Sussex Coast, *Charles M. Woodford*, 292. Second Broods
 in 1921, *E. A. C. Stowell*, 293. *Pararge megera* Treble-brooded, *Thomas*
South, 293. *Pararge megera*, etc., *R. Gatty*, 293. *Pararge megera*
Treble-brooded, *Gertrude F. Mathew Paymaster in Chief*, R.N., F.L.S., 294.
Pararge megera Treble-brooded, *F. W. Frischauf*, 294. What is *Zygaena* ab.
hippocrepidis?, *R. H. Ratray* (Colonel), 295. Butterflies on the South
 Salisbury Downs, 1921, *A. Steven Corbet*, 295. Notes on *Lycenide* in 1921
 in North Kent, *R. H. Ratray* (Colonel), 296. *Deilepora pulchella* in Sussex,
Gerald Hugh Brown, 298.
- SOCIETIES. The Entomological Society of London, 299. The South London
 Entomological Society, 300. London Natural History Society, 301. Entomo-
 logical Society of Hampshire and the Isle of Wight, 301.
- OBITUARY, 302.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 33) can be supplied separately at the
 following prices, 1890 to 1914, 1s. each, double numbers, 2s. each, 1915 and 1916,
 9d. each, double numbers, 1s. 6d.; 1917 and 1918 (already out of print), 1s. 6d. each.
 Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at 15s. each;
 1915 and 1916 at 10s. 6d., 1918, 15s. Carriage extra.

CABINETS.

Finest Materials. Best Workmanship.
 Any size to order. Satisfaction guaran-
 teed. Sample Drawer on application.

APPARATUS.

LARGE STOCK of Store Boxes,
 Setting Boards, Larva Cages,
 Pins, Nets, etc., etc.

Many good Aberrations of BRITISH LEPIDOPTERA. Selections on approval.

Write for Lists to

LEONARD TATCHELL, Entomologist,
 43 SPRATT-HALL ROAD, WANSTEAD, E. 11.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:

Lists of Apparatus, Books, Palæarctic, Indo-Australian, African or American Lepidoptera.

Orders can now be received for Peat, Glass-Bottomed Boxes, Cork, Glass Tubes, Carton Boxes Lined Peat or Cork, 5s. Also New Stock of Setting Boards, Store Boxes, Wood Postal Boxes.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

THE BIRDS OF THE BRITISH ISLES AND THEIR EGGS.

By T. A. COWARD, M.B.O.U., F.Z.S., F.E.S.

FIRST SERIES. Comprising Families *Corvidæ* to *Sulidæ*. 242 accurately Coloured Illustrations by A. THORBURN and others. Also 65 Photographic Illustrations by R. KEARTON and others. 12/6 net.

SECOND SERIES. Families *Anatidæ* to *Tetraonidæ*. 213 Coloured and 65 Photographic Illustrations. 12/6 net.

LONDON: FREDERICK WARNE & CO., LTD.

BUTTERFLIES AND MOTHS OF THE BRITISH ISLES. New Edition, with Special Index, now in the Press.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. **FIRST SERIES.** By RICHARD SOUTH, F.E.S., Editor of 'The Entomologist,' etc. With 671 accurately Coloured Examples figuring every Species and many Varieties, also Drawings of Eggs, Caterpillars, Chrysalids and Food Plants comprised in the families *Sphingidæ* to *Noctuidæ*, together with Illustrations in the Text. In pocket size (6½ by 4½ in.), cloth gilt, round corners. 12/6 net.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Texts. **SECOND SERIES.** On the same plan as the First Series. With upwards of 800 accurately Coloured Examples figuring every Species and many Varieties. 12/6 net.

THE BUTTERFLIES OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. With 450 accurately Coloured Examples figuring every Species and many Varieties, together with Illustrations in the Text. 8/6 net.

LONDON: FREDERICK WARNE & CO., LTD.

Orders may be sent to RICHARD SOUTH, 4, Mapesbury Court, Brondesbury, London, N.W. 2.

EXCEPTIONAL OFFER

OF

MORPHOS.

Every Specimen GUARANTEED FIRST QUALITY & Sold ON APPROVAL.

	♂	♀		♂	♀
	s. d.	s. d.		s. d.	s. d.
MORPHO amphitruon	6 0	—	MORPHO caeica	20 0	—
perseus	20 0	—	eugenia	25 0	—
metellus	20 0	—	(v.s.)	40 0	—
hecuba (v.s.)	25 0	60 0	adonis	12 6	—
laertes	4 0	6 0	(v.s.)	20 0	—
achilles	3 0	—	auriola	6 6	—
achillides	5 0	—	lympharis	20 0	—
coelitis	6 0	—	amathonte	7 6	—
papirius	5 0	12 0	menelaus	8 6	—
		(pass)	(v.s.)	10 6	—
agamedes	6 0	—	melacheilus	15 0	—
deidamia	5 0	—	didius	6 0	15 0
aega	10 0	—			(pass)
rhetenor	15 0	—	cypris	22 0	—
(v.s.)	25 0	—	(pass)	12 6	—

V.S. signifies "very special" and are strongly recommended, being unblemished specimens from large series sent recently by OUR OWN COLLECTORS.

SPECIAL QUOTATIONS for Menelaus & Rhetenor in LARGE QUANTITIES.

IMPORTANT STOCKS of Rare and Common TROIDES, PAPILIONINÆ, BRASSOLINÆ, HELICONIIDÆ, NYMPHALIDÆ (including AGRIAS), at very Reduced Prices.

LIST FREE ON APPLICATION. TRADE SUPPLIED.

TERMS.—Cash with order. 1/6 extra for box and registered postage.

WATKINS & TULLETT,
2, Edward St., Wardour St., London, W. 1.

WANTED.

QUANTITY OF

Morpho menelaus. M. rhetenor.

SOUTH AMERICAN COLLECTORS

and others, please quote for cash to

F.E.S., c/o ADLARD & SON & WEST NEWMAN, Ltd.,
BARTHOLOMEW CLOSE, LONDON, E.C. 1.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:

Lists of Apparatus, Books, Palæarctic, Indo-Australian, African or American Lepidoptera.

Orders can now be received for Peat, Glass-Bottomed Boxes, Cork, Glass Tubes, Carton Boxes Lined Peat or Cork, 5s. Also New Stock of Setting Boards, Store Boxes, Wood Postal Boxes.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE.

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, **9/9**; 2,000, **12/9**; 3,000, **15/9**.

Locality and date only (2 lines): 1,000 labels, **9/-**; 2,000, **12/-**; 3,000, **15/-**.





FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, **12/-**; 2,000, **15/-**; 3,000, **18/-**.

Locality and date only (2 lines): 1,000 labels, **10/6**; 2,000, **13/6**; 3,000, **16/6**.

Unequal quantities of localities, etc., or each additional line, in either style of type, **1 6 extra**. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations (, , , ) 100, **1 6**; 300, **3/-**.

Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Geirard; 1412.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

To Professional Naturalists, Naturalists' Appliance Dealers, and others.

Has anyone any use for the services and small capital of an ex-officer (public school man) who is a keen entomologist (particularly Lepidoptera) and general naturalist? Prepared to give whole-time services and to invest £250 immediately, with possibility of further investment at a later date. Reply to "S," c/o National Provincial & Union Bank, Broadstairs, Kent.

Ministry of Agriculture and Fisheries.

A PPLICATIONS are invited for the post of Technical Assistant (Laboratory Attendant) in Entomology at the Ministry's Pathological Laboratory, Harpenden, Herts. The commencing salary will be approximately £290 a year (inclusive of bonus). Candidates should have had experience in the collection, rearing and preservation of specimens, and the construction of simple apparatus for entomological work. Preference will be given to ex-service men.

Application forms can be obtained from the Secretary, Ministry of Agriculture and Fisheries, 10, Whitehall Place, S.W.1, and should be returned not later than 16th April.

WATKINS AND TULLETT,

2, Edward St., Wardour St.,

LONDON, W. 1.

Large Stocks of **EXOTIC LEPIDOPTERA** at specially low rates, including Entire Collections of any Particular Group from various localities in South America.

Interesting Assorted Unset "Lots" from £3 per hundred, guaranteed in good condition.

Magnificent Collection of **MORPHOS** on hand, including: Hecuba (males and females), Hercules, Amphitrion, Rhetenor (males and females), Casica, Cypris, Eugenia, Adonis, Auriola, Lympharis, Sulkowski, Menelaus, Melacheilus, Didius and sundry Achilles group.

MORPHOS (2nds) suitable for the Jewellery Trade.

PRICE LIST OF PARCELS AND SPECIMENS ON APPLICATION.

NEW LARVÆ-REARING CAGE

Pollard's Improved Breeding & Pairing Cage.

LIGHT, AIR AND SPACE.

Strong and durable. Put together in five minutes. It is so made that it can be packed flat or several converted into one box to hold other apparatus when travelling.

WILL REAR 200 TO 300 LARVÆ AT ONE TIME.

Size 2 ft. × 1 ft. × 1 ft. Other sizes made to order.

RECOMMENDED BY LEADING ENTOMOLOGISTS.

Price, complete, 16/6, cash with order.

Carriage paid on three or more cages; 1/- extra on single cages.

BY USING THIS CAGE

You Save 50 % Time, Trouble, Losses and Disappointment.

Order now to ensure delivery before season commences.

C. G. POLLARD, The Maples, BONCHURCH, ISLE OF WIGHT.

STEVENS' AUCTION ROOMS.

Tuesday, January 18th,
1921, at 12.30.

Estd. 1760.

38, King Street, Covent Garden, London, W.C. 2.

MR. J. C. STEVENS has received instructions to sell by auction the Collection of British Lepidoptera formed by the late Edward Marshall, Esq., F.E.S., including rare species and varieties. Also British Lepidoptera from other sources, many cabinets, etc.

On view day prior and morning of sale.

Catalogues on application.

FOR SALE.

FINE COLLECTION of BRITISH LEPIDOPTERA.

Many Rare Specimens.

To be seen in the City.

Apply: P. H. BARKER, London Road, Wickford, Essex.

(Telephone No.: City 2000. Extension 123.)

POLLARD'S Improved PINNING GAUGE

Insures regularity of height of insects in your cabinet.

Price 4/6, post free.

C. G. POLLARD, The Maples, Bonchurch, Ventnor, I. of W.

ENTOMOLOGICAL DATA LABELS.

ORDINARY TYPE:

Locality, date, and name (3 lines), one to six localities, *equal numbers*, neatly and legibly printed on good paper: 1,000 labels, 9/9; 2,000, 12/9; 3,000, 15/9.

Locality and date only (2 lines): 1,000 labels, 9/-; 2,000, 12/-; 3,000, 15/-.

FOR MICROLEPIDOPTERA, &c.

Printed in the **smallest type made** ("Brilliant"), essential for such small subjects, including locality, date, and name (3 lines), one to six localities, *equal numbers*:

1,000 labels, 12/-; 2,000, 15/-; 3,000, 18/-.

Locality and date only (2 lines): 1,000 labels, 10/6; 2,000, 13/6; 3,000, 16/6.

Unequal quantities of localities, etc., or each additional line, in either style of type, 1/6 extra. Special wordings, involving more than the average amount of matter, printed to order.

Pointers for Aberrations



100, 1/6; 300, 3/-
Please state whether *open* or *black* pointers required.

Herbarium and other labels also supplied.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

**Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.**

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:

**Lists of Apparatus, Books, Palæarctic, Indo-
Australian, African or American Lepidoptera.**

NOTE.—Kindly note that after Christmas no further business can be transacted by post, as Mr. Bentall is leaving for the West Indies and South America and will be absent about four months. The office in Southampton Street will be open as usual.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

See January issue of the 'Entomologist'
FOR
**Pollard's Larvæ Rearing Cage and
Pinning Gauge Advertisement.**

LABOUR-SAVING LOCALITY LABELS FOR ENTOMOLOGICAL SPECIMENS.

As supplied to leading collectors at home and abroad.

Make a note of my address and write to-day for New Price List.

FRANK LITTLEWOOD (DEPT. E.), 22, HIGHGATE, KENDAL.

"ENTOMOLOGIST"

REVISED PRICES FOR BACK NUMBERS.

Most of the Single Parts from 1890 (Vol. 23) can be supplied separately at the following prices: 1890 to 1914, **1s.** each, double numbers, **2s.** each; 1915 and 1916, **9d.** each, double numbers, **1s. 6d.**; 1917 and 1918, **1s. 6d.** each. Bound Volumes for 1890 to 1914 can be supplied (except 1910, Vol. 43) at **15s.** each; 1915 and 1916 at **10s. 6d.**; 1918, **15s.**

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

A HANDBOOK TO THE BRITISH ORTHOPTERA.

MALCOLM BURR, F.Z.S., F.E.S., etc. Six hand-coloured plates. "Will prove most useful . . . cannot fail to induce many entomologists to take up the study."—*Science Gossip*. Last few copies, newly bound, 5/9 post free.—CHARLES MOSLEY, 24, Upper George Street, Huddersfield.

Mr. A. H. THOMPSON

Is prepared to undertake the relaxing and setting of papered butterflies.

Address—

54, CHURCH ROAD, NORTHWICH.

WANTED.

QUANTITY OF

Morpho menelaus. M. rhetenor.

SOUTH AMERICAN COLLECTORS

and others, please quote for cash to

**F.E.S., c/o ADLARD & SON & WEST NEWMAN, Ltd.,
BARTHOLOMEW CLOSE, LONDON, E.C. 1.**

FOR SALE.

A Fine Lot of Well-Set LEPIDOPTERA,

INCLUDING MANY LOCAL AND RARE VARIETIES.

PUPÆ, OVA, ETC.

All at REASONABLE PRICES. Lists Free.

Good Varieties and Local Species Bought for CASH.

FOR PRICE LISTS APPLY TO

THOMAS SALVAGE, THE PLAQUET, ARLINGTON, SUSSEX.

G. A. BENTALL,
Natural Science Establishment
(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:

**Lists of Apparatus, Books, Palæarctic, Indo-
Australian, African or American Lepidoptera.**

NOTE.—Kindly note that after Christmas no further business can be transacted by post, as Mr. Bentall is leaving for the West Indies and South America and will be absent about four months. The office in Southampton Street will be open as usual.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

**THE 'ENTOMOLOGIST' SYNONYMIC LIST OF
BRITISH LEPIDOPTERA.**

By RICHARD SOUTH, F.E.S. Demy 8vo. For reference only, 6d.

The **Exchange List** (containing the whole of the British Lepidoptera complete on a single sheet of note-paper), 2d., post-free 2½d.

ADLARD & SON & WEST NEWMAN, LTD., LONDON AND DORKING.

PRICE 7s. 6d. POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ, HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

FOR SALE.

A Fine Lot of Well-Set LEPIDOPTERA,

INCLUDING MANY LOCAL AND RARE VARIETIES.

PUPÆ, OVA, ETC.

All at REASONABLE PRICES. Lists Free.

Good Varieties and Local Species Bought for CASH.

FOR PRICE LISTS APPLY TO

THOMAS SALVAGE, THE PLAQUET, ARLINGTON, SUSSEX.

WANTED.

QUANTITY OF

Morpho menelaus. M. rhetenor.

SOUTH AMERICAN COLLECTORS

and others, please quote for cash to

F.E.S., c/o ADLARD & SON & WEST NEWMAN, Ltd.,

BARTHOLOMEW CLOSE, LONDON, E.C. 1.

Cloth, foolscap 8vo. Price 3s. 6d. Postage 4d.

POCKET-BOOK of BRITISH BIRDS

By E. F. M. ELMS.

"An inexpensive volume, which well deserves to be a 'pocket-book' for those who wish to become field ornithologists."—*Zoologist*.

"Contains more information on British Birds in a compact form than any book with which we are acquainted."—*The Auk*.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:
Lists of Apparatus, Books, Palæarctic, Indo-Australian, African or American Lepidoptera.

Orders can now be received for Peat, Glass-Bottomed Boxes, Cork, Glass Tubes, Carton Boxes Lined Peat or Cork, 5s. Also New Stock of Setting Boards, Store Boxes, Wood Postal Boxes.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

EXCEPTIONAL OFFER

OF

RARE EXOTIC RHOPALOCERA
(FOR MARCH ONLY).

Prices for specimens ONLY in FIRST-CLASS CONDITION:

	♂	♀
Papilio columbus	15 0	1 2 0
„ homerus	2 0 0	—
„ weiskei	1 7 6	—
„ androcles	10 6	—
Armandia lidderdalei	1 0 0	1 15 0
Agrias claudia sahlkei	1 10 0	2 10 0
„ lugina	2 10 0	—
„ narcissus	12 10 0	15 0 0
Callithea depueseti	4 6	12 0

LARGE STOCKS OF MORPHOS AND OTHER "EXOTICS."

Price List on application.

WATKINS & TULLETT, 2, Edward St., London, W. 1.
Wardour St.,

STEVENS' AUCTION ROOMS.

Established 1760.

Tuesday, March 15th, at 12.30.

MR. J. C. STEVENS will sell by auction at his Rooms, 38, King Street, Covent Garden, London, W.C. 2.—

The first portion of the **Collection of Lepidoptera formed by the late B. A. Bower, Esq., of Chislehurst**, comprising the Butterflies and the Moths to the end of the Noctuæ, all carefully labelled, well set, and in excellent condition, including *Dispar*, ♂ and ♀; *Subrosea* of exceptionally fine colour, *Lathonia* 3, *Antiopa* 3, *Centonalis*, *Pulchella*, *Cænosa* 17, *Ilicifolia* 5, *Viduaria*, *Polygrammata* 14, *Reticulata*, 22, *Strigosa* 27, bred; *Musculosa*, *Alpina* 19, *Erythrocephala*, *Gnaphali* 5, *Conformis* 8, *Satura*, *Fraxini* 2, etc.

Many rare varieties and local forms, together with the valuable Mahogany Cabinets, one of 34 and one of 51 drawers. Also 'The Entomologist,' 44 vols.; 'Entomologists' Monthly Magazine,' 50 vols.; 'Cambridge Natural History,' 10 vols.; Buckler's 'Larvæ,' 9 vols.; Stainton's 'Tineina,' 13 vols.; and other books, store boxes, etc.

Also British and Exotic Lepidoptera from other sources.

On view day prior and morning of sale.

Catalogues on application.

WANTED.—A copy of 'British Butterflies' by J. W. Tutt, 1895. Will anyone having a copy they wish to dispose of apply to me stating condition, price, etc.?

COL. R. H. RATTRAY, 68, Dry Hill Park Road, Tonbridge, Kent

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge :

Lists of Apparatus, Books, Palæarctic, Indo-Australian, African or American Lepidoptera.

Orders can now be received for Peat, Glass-Bottomed Boxes, Cork, Glass Tubes, Carton Boxes Lined Peat or Cork, 5s. Also New Stock of Setting Boards, Store Boxes, Wood Postal Boxes.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

THE BIRDS OF THE BRITISH ISLES AND THEIR EGGS.

By T. A. COWARD, M.B.O.U., F.Z.S., F.E.S.

Complete in two volumes, pocket size, $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in. Each 12/6 net. With accurately Coloured Illustrations by ARCHIBALD THORBURN and others, and photographic Illustrations by RICHARD KEARTON and others.

FIRST SERIES. Comprising Families **Corvidæ to Sulidæ.** 242 Coloured and 65 Photographic Illustrations.

SECOND SERIES. Comprising Families **Anatidæ to Tetraonidæ.** 213 Coloured and 69 Photographic Illustrations.

LONDON: FREDERICK WARNE & CO., LTD.

In Pocket Size ($6\frac{1}{2}$ by $4\frac{1}{2}$ in.). Cloth Gilt, Round Corners.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. **FIRST SERIES.** By RICHARD SOUTH, F.E.S., Editor of 'The Entomologist,' etc. With 671 accurately Coloured Examples figuring every Species and many Varieties, also Drawings of Eggs, Caterpillars, Chrysalids and Food Plants comprised in the families Sphingidæ to Noctuidæ, together with Illustrations in the Text. 12/6 net.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. **SECOND SERIES.** Comprising the families Noctuidæ to Hepialidæ. On the same plan as the First Series. With upwards of 800 accurately Coloured Examples figuring every Species and many Varieties. 12/6 net.

THE BUTTERFLIES OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. By RICHARD SOUTH, F.E.S. With 450 accurately Coloured Examples figuring every Species and many Varieties, together with Illustrations in the Text. 8/6 net.

LONDON: FREDERICK WARNE & CO., LTD.

Orders may be sent to RICHARD SOUTH, 4, Mapesbury Court, Brondesbury, London, N.W. 2.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

NOW READY. Demy 8vo. Cloth extra. 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

FOR SALE.—Bound Vols. 'Entomologist,' 1900 to 1916, at 8/-; unbound ditto, 1917 and 1918, at 6/-. Also 'Entomologist's Monthly,' unbound, for 1917 and 1918, at 6/-.

G. W. MASON, BARTON-ON-HUMBER.

MACHAON, Swallow-tail.—Norfolk collector can now book orders. Larvæ 6d. each. Pupæ 10d., in due season. Guaranteed British, and sent direct from the Fens. Write—

N.S., c/o Adlard & Son & West Newman, Ltd., Bartholomew Close, E.C.1.

Cabinets, Collections of Butterflies and Beetles, Microscopes, Scientific Books, etc.—HERBERT MORRIS & SON will include in their Sale at No. 11, Eastgate Street, Lewes, Sussex, about the end of July next, a 50-drawer Mahogany Insect Cabinet, two 24-drawer Pillar Cabinets by Brady, Collections of Butterflies and Beetles, two Microscopes and Accessories by Swift as good as new, Scientific Books and other effects, late the property of a naturalist deceased. For date of sale see next advertisement. Auction Offices: Eastgate Street, Lewes, Sussex.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

**Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.**

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

Any of the following Circulars sent without charge:

Lists of Apparatus, Books, Palæarctic, Indo-Australian, African or American Lepidoptera.

Orders can now be received for Peat, Glass-Bottomed Boxes, Cork, Glass Tubes, Carton Boxes Lined Peat or Cork, 5s. Also New Stock of Setting Boards, Store Boxes, Wood Postal Boxes.

LEPIDOPTERA PURCHASED FROM ALL PARTS OF THE WORLD.

THE BIRDS OF THE BRITISH ISLES AND THEIR EGGS.

By **T. A. COWARD, M.B.O.U., F.Z.S., F.E.S.**

Complete in two volumes, pocket size, $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in. Each **12/6** net. With accurately Coloured Illustrations by **ARCHIBALD THORBURN** and others, and photographic Illustrations by **RICHARD KEARTON** and others.

FIRST SERIES. Comprising Families **Corvidæ to Sulidæ.** 242 Coloured and 65 Photographic Illustrations.

SECOND SERIES. Comprising Families **Anatidæ to Tetraonidæ.** 213 Coloured and 69 Photographic Illustrations.

LONDON: FREDERICK WARNE & CO., LTD.

In Pocket Size ($6\frac{1}{2}$ by $4\frac{1}{2}$ in.). Cloth Gilt, Round Corners.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide with Descriptive Text. **FIRST SERIES.** By **RICHARD SOUTH, F.E.S.**, Editor of 'The Entomologist,' etc. With 671 accurately Coloured Examples figuring every Species and many Varieties, also Drawings of Eggs, Caterpillars, Chrysalids and Food Plants comprised in the families Sphingidæ to Noctuidæ, together with Illustrations in the Text. **12/6** net.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. **SECOND SERIES.** Comprising the families Noctuidæ to Hepialidæ. On the same plan as the First Series. With upwards of 800 accurately Coloured Examples figuring every Species and many Varieties. **12/6** net.

THE BUTTERFLIES OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. By **RICHARD SOUTH, F.E.S.** With 450 accurately Coloured Examples figuring every Species and many Varieties, together with Illustrations in the Text. **8/6** net.

LONDON: FREDERICK WARNE & CO., LTD.

Orders may be sent to **RICHARD SOUTH, 4, Mapesbury Court, Brondesbury, London, N.W. 2.**

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

PRICE 7s. 6d.

POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ, HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

Albert H. Thompson, 54 Church Rd., Northwich

European and Exotic Papered Butterflies

Set to Order in Any Style.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies, first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

Cabinets, Collections of Butterflies, Beetles, Microscopes, etc.—
HERBERT MORRIS & SON will include in their Sale at 11, Eastgate Street, Lewes, Sussex, on Wednesday, July 20th, 1921, at about 12 o'clock, a 50-drawer Mahogany Insect Cabinet, two 24-drawer Pillar Cabinets by Brady in excellent condition, Collections of Butterflies and Beetles, two Microscopes and Accessories by Swift (nearly new), Microscopic Apparatus and Slides, Store-Boxes, Setting Boards, etc. *Note.*—The Scientific Books advertised in last issue have been withdrawn. Catalogues can be obtained of the Auctioneers, Eastgate Street, Lewes, Sussex.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

**Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.**

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

MR. BENTALL has now returned to England after a six months' collecting trip to Trinidad and British Guiana, bringing with him a large collection of insects of all orders, reptiles, curios, etc. The world-famous Kaieteur Fall, in the interior of British Guiana, was also visited, and a large photo. of this fall, together with the collection, can be seen at the above address.

Inspection cordially invited.

August, 1921.

THE BIRDS OF THE BRITISH ISLES AND THEIR EGGS.

By **T. A. COWARD, M.B.O.U., F.Z.S., F.E.S.**

Complete in two volumes, pocket size, $6\frac{1}{2}$ in. by $4\frac{1}{2}$ in. Each 12/6 net. With accurately Coloured Illustrations by ARCHIBALD THORBURN and others, and photographic Illustrations by RICHARD KEARTON and others.

FIRST SERIES. Comprising Families **Corvidæ to Sulidæ.** 242 Coloured and 65 Photographic Illustrations.

SECOND SERIES. Comprising Families **Anatidæ to Tetraonidæ.** 213 Coloured and 69 Photographic Illustrations.

LONDON: FREDERICK WARNE & CO., LTD.

In Pocket Size ($6\frac{1}{2}$ by $4\frac{1}{2}$ in.). Cloth Gilt, Round Corners.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide with Descriptive Text. **FIRST SERIES.** By RICHARD SOUTH, F.E.S., Editor of 'The Entomologist,' etc. With 671 accurately Coloured Examples figuring every Species and many Varieties, also Drawings of Eggs, Caterpillars, Chrysalids and Food Plants comprised in the families Sphingidæ to Noctuidæ, together with Illustrations in the Text. 12/6 net.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. **SECOND SERIES.** Comprising the families Noctuidæ to Hepialidæ. On the same plan as the First Series. With upwards of 800 accurately Coloured Examples figuring every Species and many Varieties. 12/6 net.

THE BUTTERFLIES OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. By RICHARD SOUTH, F.E.S. With 450 accurately Coloured Examples figuring every Species and many Varieties, together with Illustrations in the Text. 8/6 net.

LONDON: FREDERICK WARNE & CO., LTD.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

GENTLEMAN, late Officer in Special Reserve, living at Monks' Wood, desires touch with Collectors wishing to collect Butterflies and Moths in that celebrated locality; himself a collector. Accommodation offered in own Bungalow. Apply by letter only—Major MAPLES, Monks' Wood, Huntingdon.

WATKINS AND TULLETT OFFER

from a Large and Varied Collection of "Exotics"

CHOICE Specimens selected from LARGE SERIES of the following:

	♂	♀		♂	♀
MORPHO hecuba	20/-	£3 10s.	MORPHO menelaus	10/-	
" amphitriton	6/-		" melacheilus	15/-	
" metellus			" achilles	4/-	
" perseus	15/-		" achillides	5/-	
" rhetenor	20/-	£3 10s.	" coelistis	6/-	
" cacia	20/-		" agamedes	5/-	
" adonis	15/-		" papirius	5/-	15/-
" eugenia	40/-		" deidamia	5/-	

Special Quotation for Series.

Specimens sent on approval.

Passable Specimens 25 per cent. less.

Morphos RHETENOR and MENELAUS may now be supplied in large quantities.

Price List of Exotic Lepidoptera on application to

2 Edward St., Wardour St., London, W. 1.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

REDUCTION IN PRICES OF GLASS-BOTTOMED BOXES.

1½ in.	1¾ in.	1⅞ in.	1⅞ in.	2¼ in.	2½ in.	3¼ in.
6/6	6/9	7/6	8/6	9/6	10/6	14/6 doz.
7d.	7½d.	8d.	9d.	10d.	11d.	1/3 each.

New Material in Hymenoptera, Himeptera-Homoptera, Orthoptera, Odonata and Diptera from the West Indies and British Guiana.

LARGE COLLECTION OF AFRICAN CETONIDS AND
LONGICORN COLEOPTERA JUST RECEIVED.

NEW SECTION. Palæarctic and Exotic Birds' Eggs and Skins,
also Reptiles.

THE BIRDS OF THE BRITISH ISLES AND THEIR EGGS.

By T. A. COWARD, M.B.O.U., F.Z.S., F.E.S.

Complete in two volumes, pocket size, 6½ in. by 4½ in. Each 12/6 net. With accurately Coloured Illustrations by ARCHIBALD THORBURN and others, and photographic Illustrations by RICHARD KEARSTON and others.

FIRST SERIES. Comprising Families *Corvidæ* to *Sulidæ*. 242 Coloured and 65 Photographic Illustrations.

SECOND SERIES. Comprising Families *Anatidæ* to *Tetraonidæ*. 213 Coloured and 69 Photographic Illustrations.

LONDON: FREDERICK WARNE & CO., LTD.

In Pocket Size (6½ by 4½ in.). Cloth Gilt, Round Corners.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide with Descriptive Text. FIRST SERIES. By RICHARD SOUTH, F.E.S., Editor of 'The Entomologist,' etc. With 671 accurately Coloured Examples figuring every Species and many Varieties, also Drawings of Eggs, Caterpillars, Chrysalids and Food Plants comprised in the families Sphingidæ to Noctuidæ, together with Illustrations in the Text. 12/6 net.

THE MOTHS OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. SECOND SERIES. Comprising the families Noctuidæ to Hepialidæ. On the same plan as the First Series. With upwards of 800 accurately Coloured Examples figuring every Species and many Varieties. 12/6 net.

THE BUTTERFLIES OF THE BRITISH ISLES. A Complete Pocket Guide, with Descriptive Text. By RICHARD SOUTH, F.E.S. With 450 accurately Coloured Examples figuring every Species and many Varieties, together with Illustrations in the Text. 8/6 net.

LONDON: FREDERICK WARNE & CO., LTD.

Orders may be sent to RICHARD SOUTH, 4, Mapesbury Court, Brondesbury, London, N.W. 2.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

PRICE 7s. 6d.

POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ; HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

Albert H. Thompson, 54 Church Rd., Northwich
European and Exotic Papered Butterflies
Set to Order in Any Style.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies; first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

G. A. BENTALL, Natural Science Establishment (Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

New Material in Lepidoptera, Coleoptera, Hymenoptera, Himeptera-Homoptera, Orthoptera, Odonata and Diptera from the West Indies and British Guiana.

LARGE COLLECTION OF AFRICAN CETONIDS AND LONGICORN COLEOPTERA JUST RECEIVED.

Pine Store Boxes, 10 × 8", 5/6; 13 × 9", 6/6; 14 × 10", 7/-; 16 × 11", 9/-; 17½ × 12", 10/6.
Postal Boxes, hinged, wood sides, lined inside and out with cork, 5 × 3½", 2/-; 7 × 3½", 2/6.
Book Pine Store Boxes, covered green cloth, 13 × 9½ × 2½", 12/6; 14 × 10½ × 3½", 14/9; 16 × 11 × 3½", 17/6; 17½ × 12½ × 3½", 21/-.
Second-hand Book Store Boxes, covered green cloth, 16 × 13 × 3½", 8/6 each.
Carton Boxes for low set Insects, covered imitation leather paper, bound in green, lined inside top and bottom with ½" compo cork, covered with white paper. Camphor cell, wood ends and sides, hinged lid, 5/-.
Ditto for high set Insects, bottom lined with ½" peat, lid lined with ⅜" compo cork to give strength and durability, 5/-.
Superior Oval or Flat Cork Setting Boards, ½", 8d.; ¾", 9d.; 1", 10d.; 1¼", 11d.; 1½", 1/-; 1¾", 1/2; 2", 1/3; 2½", 1/6; 3", 1/8; 3½", 1/10; 4", 2/-.
Continental Setting Boards, 1", 1/-; 1½", 1/2; 1¾", 1/3; 2", 1/4; 2½", 1/6; 3", 1/9; 3½", 1/11; 4", 2/6; 4½", 2/0; 5", 3/-.
Adjustable Setting Boards, corked and papered, 7/9. Ditto, Plain Wood, 5/9.

FOR SALE.—Nearly every species of British Macro-Lepidoptera on hand, including local forms, all in perfect condition and at lowest possible prices. Also many pupæ, none inbred. Lists now ready.

A. J. SPILLER, Chinnor, Wallingford.

Albert H. Thompson, 54 Church Rd., Northwich

Butterflies Set from Papers in English or
Continental Styles.

Terms on Request.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

MEETINGS OF SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON, 41, Queen's Gate, S.W. 7 (nearest stations, South Kensington and Gloucester Road).—*November 2nd and 16th at 8 p.m.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY, Hibernia Chambers, London Bridge, S.E. 1.—*Thursday, November 10th*, Ordinary Meeting at 7 p.m., Paper, "The Common Lands of London," by the Commons and Footpaths Preservation Society. *Thursday, November 24th*, Annual Exhibition at 7 p.m.—*Hon. Sec.*, STANLEY EDWARDS, F.L.S., *etc.*, 5, St. German's Place, Blackheath, S.E. 3.

LONDON NATURAL HISTORY SOCIETY now meets in Hall 40, Winchester House, Old Broad Street, E.C. 2, at 6.30 p.m. Full Society meetings are held on the first *Tuesday* in each month, and sectional meetings on the third *Tuesday*. Visitors welcomed at all meetings.—*Hon. Sec.*, W. E. GLEGG, 44, Belfast Road, N. 16.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C.1.

PRICE 7s. 6d.

POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ, HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

COLOMBIAN BUTTERFLIES WHOLESALE.

I am prepared to supply the trade (Wholesale) with mixed Colombian Butterflies, first quality, papered, original unpicked collectings; rare and common included. Morpho cypris and Amathonte for sale in Wholesale lots only. Large and regular shipments. Please state exactly what you want, and quantity. Prices on application.

GEO. G. MacBEAN (Dealer), Assiniboia, Sask., Canada.

G. A. BENTALL,

Natural Science Establishment

(Entomology),

Dudley House, Southampton Street,
STRAND, LONDON, W.C. 2.

ENTOMOLOGICAL SUPPLIES OF ALL KINDS.

REDUCTION IN PRICES OF GLASS-BOTTOMED BOXES.

1½ in.	1¾ in.	1⅞ in.	1⅞ in.	2¼ in.	2½ in.	3¼ in.
6/6	6/9	7/6	8/6	9/6	10/6	14/6 doz.
7d.	7½d.	8d.	9d.	10d.	11d.	1/3 each.

New Material in Hymenoptera, Himeptera-Homoptera, Orthoptera, Odonata and Diptera from the West Indies and British Guiana.

*LARGE COLLECTION OF AFRICAN CETONIDS AND
LONGICORN COLEOPTERA JUST RECEIVED.*

NEW SECTION. Palæarctic and Exotic Birds' Skins, also Reptiles.

EXOTIC LEPIDOPTERA.

Large Collection for Sale in magnificent condition, together with Cabinets of 400-500 drawers suitable for museum. Many interesting series of Island forms. Collection growing too large for present owner. Could be divided into sections separately to suit buyers' requirements.

S. G. HAYES, 61, Eltham Road, Lee, S.E.

STEVENS'S AUCTION ROOMS, Ltd.

38, King Street, Covent Garden, London, W.C. 2.

TUESDAY, OCTOBER 18th, at 12.30.

MR. J. C. STEVENS will sell by auction—

The Collection of the late A. E. Hudd, Esq., F.E.S., including British Lepidoptera, Exotic Lamellicornia, Longicornia, and other Coleoptera, named and arranged in large 45-drawer cabinet; Exotic Lepidoptera in store boxes. Also Store Boxes, Cabinets, Books, etc., from various sources.

On view day prior and morning of Sale. Catalogues on application.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

PRIVATE SALE.—Old Collector wishes to dispose of **Solid Mahogany 40-drawer Insect Cabinet**, perfect condition, 45 years old (British flies—no value). Particulars—**WOOLLER, 6, KING HENRY'S STREET, MILDMAY ROAD, N.**

“Practical Lepidoptera Breeding”

The little book that really tells you how to do it.

Invaluable to the young entomologist. **1/2 post free.**

F. J. TAMPIN, 33, North Cray Rd., Bexley, Kent.

FOR SALE.—Nearly every species of British Macro-Lepidoptera on hand, including local forms, all in perfect condition and at lowest possible prices. Also many pupæ, none inbred. Lists now ready.

A. J. SPILLER, Chinnor, Wallingford.

Cloth, foolscap 8vo. Price 3s. 6d. Postage 4d.

POCKET-BOOK of BRITISH BIRDS

By **E. F. M. ELMS.**

“An inexpensive volume, which well deserves to be a ‘pocket-book’ for those who wish to become field ornithologists.”—*Zoologist*.

“Contains more information on British Birds in a compact form than any book with which we are acquainted.”—*The Auk*.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

G. A. BENTALL

Naturalist

(Dudley House, Southampton Street, Strand)

REMOVED TO LARGER PREMISES 392 STRAND

(1st Floor) LONDON, W.C. 2.

Entomological Supplies of all kinds.

SECTIONAL ENTOMOLOGICAL CABINETS.

A new departure in Entomological Cabinets now being manufactured and sold in Sections at the undermentioned greatly reduced prices. The **Top and Base Fittings** are purchased separately. Drawer-locking device extra. A complete 4-Sectional Cabinet of 20 Drawers can be seen on the premises after the 12th December.

Further particulars sent on application.

Drawers.	Size.	Visible Parts Mahogany.	Solid Mahogany.	Top Fittings, Sizes 1-3	£1 0 0
17" x 15" x 2"	1	£7 15 0	£9 0 0	" " 4-6	1 1 0
17" x 15" x 2 1/2"	2	8 0 0	9 7 6	Base Fittings, Sizes 1-3	18 0
18" x 18" x 2"	4	8 15 0	10 0 0	" " 4-6	18 6
18" x 18" x 2 1/2"	5	9 0 0	10 7 6		

Albert H. Thompson, 54 Church Rd., Northwich

**Butterflies Set from Papers in English or
Continental Styles.**

Terms on Request.

WANTED AT ONCE.—Hundreds of *Lycæna belargus* ♂, *Corydon* ♂, *Euchloe cardamines* ♂, and *Vanessa io* ♂ or ♀. Also a few *Thecla rubi* and *Lyc. arion*. Will give cash or exchange. Can offer Californian or Tropical Butterflies. Dealers or collectors of butterflies in India, Java, Oceania, etc., please send list of showy butterflies.

HAL NEWCOMB, 804, Elizabeth St., PASADENA, CALIF., U.S.A.

Demy 8vo, Cloth. 292 pp. 354 illustrations.

PLANT GALLS OF GREAT BRITAIN.

A. NATURE STUDY HANDBOOK.

BY

EDWARD T. CONNOLD, F.Z.S., F.E.S.

Price 5s. net; post free, 5s. 6d.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.

NATURAL HISTORY BOOKS AND SERIALS.

JOHN WHELDON & CO. have the largest stock in the country of Books in all departments of Natural History and Science, also Transactions and Journals of Learned Societies, etc., in sets, runs, and single volumes or numbers. **Large Collection of Entomological Books always in Stock.**

Libraries or small parcels purchased.

WANTED. 'Canadian Entomologist,' Vols. 30-31 (1898-99). 'Annales Société Entomologique de France,' 1833 (or Vol. 2, No. 1), 1839 (or Vol. 8).

38, GREAT QUEEN ST., KINGSWAY, LONDON, W.C. 2.

Telephone: Gerrard, 1412.

TYPICAL FLIES

A Photographic Atlas. Second Series.

By E. K. PEARCE.

With 125 photographs. Royal 8vo. 15s net.

"The photographs are as good as any we have seen of this class of insect—a peculiarly difficult class to represent pictorially in any natural manner; the venation of the wings is well brought out wherever the banding or colouring of the wings does not obscure it, and there are excellent short notes as to habitat, larval habits, and so on under the pictures."

Nature on FIRST SERIES.

CAMBRIDGE UNIVERSITY PRESS, FETTER LANE, LONDON, E.C. 4: C. F. CLAY, MANAGER.

PRICE 7s. 6d.

POSTAGE 6d.

BRITISH PYRALIDES,

By JOHN HENRY LEECH,

INCLUDING THE

AVENTIIDÆ, HERMINIIDÆ, HYPENIDÆ AND PTEROPHORIDÆ.

With Eighteen Fine Lithographic Plates.

ADLARD & SON & WEST NEWMAN, LTD., 23, Bartholomew Close, London, E.C. 1.

NOW READY. Demy 8vo, Cloth extra, 276 pp., Three Coloured and Eight Uncoloured Plates, with Diagrams in the text.

VIGOUR AND HEREDITY

BY

J. LEWIS BONHOTE, M.A., F.L.S., F.Z.S.

Price 10s. 6d. net.

ADLARD & SON & WEST NEWMAN, Ltd., Bartholomew Close, London, E.C. 1.





1921.

Vol. 54

SMITHSONIAN INSTITUTION LIBRARIES



3 9088 00908 1431